VOLUME XI AUGUST 1918 NUMBER 8

Southern Medical Journal

Journal of The Southern Medical Association

Published monthly at Birmingham, Alabama. Subscription $3.00 the year. Entered as Second-Class Matter at the Postoffice at Birmingham, Alabama, under Act of March 3, 1879.

TABLE OF CONTENTS

TROPICAL DISEASE AND PUBLIC HEALTH

The Importance of Malaria from a Public Health and Economic Standpoint. W. S. Leathers, University, Miss. 541

Discussed by H. R. Carter, U. S. Public Health Service, Baltimore, Md.; Oscar Dowling, Shreveport, La.; Frederick J. Waas, Jacksonville, Fla.; C. C. Bass, New Orleans, La.

Modern Aspects of Malaria Problems in Peace and War. Frederick L. Hoffman, Newark, N. J. 545

Discussed by W. S. Leathers, University, Miss.; John W. Kerr, U. S. Public Health Service, Washington, D. C.; H. R. Carter, U. S. Public Health Service, Baltimore, Md.

Malaria Control in the Environment of the Cantonments. J. A. LePrince, Washington, D. C. 551

Discussed by C. C. Pierce, U. S. Public Health Service, Little Rock, Ark.; Joseph H. White, U. S. Public Health Service, Memphis, Tenn.; Arthur T. McCormack, Bowling Green, Ky.; Oscar Dowling, Shreveport, La.; William Krauss, Memphis, Tenn.; H. R. Carter, U. S. Public Health Service, Baltimore, Md.

Some Results of Malaria Control by Control of the Insect Host: Public Health and Economic Aspects. R. C. Derivaux, Washington, D. C. 556

Discussed by John A. Ferrell, New York, N. Y.; Charles W. Garrison, Little Rock, Ark.; C. C. Pierce, U. S. Public Health Service, Little Rock, Ark.

(Concluded on next page)

THE NEW GRAVES

GYNECOLOGY. By William P. Graves, M.D., Prof. of Gynecology, Harvard Medical School. Octavo of 885 pages, with about 500 illustrations, 100 of which are in colors. Second edition, published July, 1918. Cloth, price $7.75

This new work presents gynecology along new lines. An entire section is devoted exclusively to the physiology of the pelvic organs and to correlated gynecology—the relationship of gynecology to organs of internal secretion, breast, skin, organs of sense, digestion and respiration, blood, circulatory apparatus, abdominal organs, nervous system, bones and joints.

The third part is exclusively a treatise on surgical gynecology and includes profuse descriptions of those gynecologic operations that the author deems most feasible.

The work has been revised from cover to cover and much new matter has been added.

J. A. MAJORS COMPANY

1710 Commerce St. DALLAS

1301 TULANE AVE. NEW ORLEANS

Chicago Laboratory, 25 East Washington Street, Chicago, Illinois, see page 34

TABLE OF CONTENTS—Concluded

The Bearing of Malaria on Railroad Operation. H. W. Van Hovenberg, Tyler, Tex. 562

Discussed by Albert E. Campbell, Chicago, Ills.; J. A. LePrince, U. S. Public Health Service, Washington, D. C.; C. C. Bass, New Orleans, La.; W. F. Smith, Little Rock, Ark.; H. R. Carter, U. S. Public Health Service, Baltimore, Md.

Geologic Surveys and the Eradication of Malaria. Thomas Wayland Vaughan, Washington, D. C. 569

Our Malaria Campaign. W. C. Johnson, Memphis, Tenn. 572

Memphis' Malaria Problem. Bolton Smith, Memphis, Tenn. 574

Addresses of Mr. Johnson and Mr. Smith discussed by Thomas Clarke Graves, Memphis, Tenn.; John W. Kerr, U. S. Public Health Service, Washington, D. C.

What the Cotton Belt Railway Company is Doing for the Prevention of Malaria. H. H. Smiley, Texarkana, Ark. 576

MEDICINE—Internal Diseases, Pediatrics, Neurology, Diagnostic Methods, Etc.

Chronic Acidosis: Etiology, Prophylaxis and Treatment. George C. Mizell, Atlanta, Ga. 578

Discussed by Allan Eustis, New Orleans, La.; Anthony Bassler, New York, N. Y.; M. L. Graves, Galveston, Tex.

SURGERY—War, Railway, Industrial, Gynecological, Obstetrical and Urological.

Treatment of Tropical Abscess of the Liver. John S. Helms, Tampa, Fla. 582

EYE, EAR, NOSE AND THROAT

A Mixed Tumor of the Lachrymal Gland. Adolph O. Pfingst, Louisville, Ky. 587

EDITORIALS 591

CORRESPONDENCE 596

BOOK REVIEWS 597

SOUTHERN MEDICAL NEWS 599

Case Records of the Massachusetts General Hospital

Edited by

RICHARD C. CABOT, M. D., and HUGH CABOT, M. D.

A weekly publication, reproducing clinico-pathological exercises held at the Massachusetts General Hospital. Illustrated with charts, diagrams and reproductions of x-ray plates, other photographs and photomicrographs.

A COURSE IN DIAGNOSIS

One of the editors, or some other physician or surgeon of the hospital staff, reads the clinical record, discusses the differential diagnosis, and commits himself to the best diagnosis he can make. The pathologist then discusses the necropsy.

The printed sheets are so arranged that by reading the history, making his own diagnosis, and then turning to the second sheet to learn the postmortem result, the reader may get something of the same training in diagnosis that is furnished in the hospital class.

Although the series is intended primarily as a course in diagnosis, at the request of subscribers occasional cases are included emphasizing therapeutics.

Opinions of Subscribers

"These sheets are the most valuable and informing of any that come to my desk, and I look forward to their arrival with intense pleasure and interest."

"To a great many of us these cases are the only postgraduate work we have at the present time."

"I would be willing to double my subscription price if generally desired. My judgment is that no active physician can get more assistance from any source."

"Never have I seen anything more original, suggestive and practical than this teaching."

Sample Copies Will Be Sent

on application to the Massachusetts General Hospital, Boston. Subscription, $5.00 per annum, payable in advance. Club rates on application. Checks should be made payable to the hospital.

"The Success of the Century"

A Revised Edition of the Monumental

BILLINGS-FORCHHEIMER THERAPEUSIS

"THE REMEDIES THEMSELVES—HOW TO USE THEM"

In accordance with their desire to keep the Billings-Forchheimer Therapeusis of Internal Diseases always the most dependable source of therapeutic information, D. Appleton & Company have issued a revised edition incorporating the latest knowledge regarding the remedies themselves and how to use them. The success of this work has been so great that it no longer needs exploitation. If you have never used it, ask any one of your colleagues who has, to tell you frankly what he thinks of it. It covers the entire range of Therapeusis. The Serums, Vaccines, Organotherapy, Hydrotherapy, Electrotherapy — all the new things are included. In all the history of medical literature there has never been a more practical, helpful work than this, as the testimony of thousands of doctors already proves. Write for information today.

NOTE: In order that physicians already possessing the work may keep their sets up to date, a special volume has been prepared for them containing all of the new material included in the revision, with complete cross reference index. If you were an original subscriber and did not receive this supplementary volume, write at once to D. Appleton & Company.

You Can Measure Its Value in Actual Results. Ask the Man Who Owns One

Fill out this convenient order form and the work will be sent you at once

D. Appleton & Company
35 West 32d St., New York

Please send me, prepaid, the BILLINGS-FORCHHEIMER THERAPEUSIS, five volumes, with desk index, cloth binding, price $33.50. I enclose check for $4.00 and agree to pay the balance in monthly instalments of $4.00 until paid in full. (Or charge to my account.)

Name .....

Street .....

City .....

So-8-18

SAINT ELIZABETH'S HOSPITAL

617 West Grace Street, **RICHMOND, VIRGINIA**

A thoroughly equipped and modern private hospital for surgical and gynecological patients. Absolutely fire-proof—a desirable requirement in any building, but a necessity in a surgical hospital. Constructed of tapestry brick, Pennsylvania brown stone, and reinforced concrete. Location is excellent, very quiet, but accessible. The building is half a block from the Franklin street side of Monroe Park. Ventilation perfect—due to the general design of architect, who is an authority on ventilation, and also to the patent Austral windows, which direct the air current towards the ceiling and not on the patient.

Only graduate nurses are employed.

All modern conveniences, such as silent electric light signals for patients and long distance telephone connection in every bedroom.

Two large and complete operating rooms with northern light are on the top floor, where they are practically free from dust. The hospital is open the entire year. No wards, only single or double rooms, with or without private bath.

An addition to St. Elizabeth's Hospital containing 18 beds has recently been completed, which makes a total capacity of 48 beds. The addition is of the same general construction as the original building.

A limited number of graduate nurses received for post-graduate instruction.

For information, apply to the Superintendent, MISS MYRA E. STONE, R. N., or to

J. SHELTON HORSLEY, M. D., Surgeon-In-Charge.

ARTHUR S. BRINKLEY, M. D., Associate Surgeon.

DR. J. F. YARBROUGH'S SANATORIUM

COLUMBIA, ALABAMA

For the Special Treatment of PELLAGRA, "BRIGHT'S DISEASE" DYSPEPSIA AND INDIGESTION

TRAINED NURSES

CONSULTING STAFF

M. S. DAVIE, M.D., Dothan, Ala. ROSS MOOTY, B.S., M.D., Columbia, Ala.

ALFRED SMITH FRASIER, F.A.C.S., Dothan, Ala. HENRY GREEN, M.D., Dothan, Ala.

CURRAN POPE A. THRUSTON POPE

A MODERN up-to-date, private Infirmary equipped with steam heat, electric lights, electric fans, modern plumbing and superior furnishings. Solicits all cases of functional and organic nervous diseases, diseases of the stomach and intestines, rheumatism, gout and uric acid troubles, drug habits and alcoholism. Bed-ridden cases not received without previous arrangement.

Hydrotherapy, Mechanical Massage, Static, Galvanic, Faradic, Sinusoidal, High Frequency, Leucodescent and Arc Light, and X-ray treatments given by competent physicians and nurses, under the immediate supervision of the Medical Superintendent. Special laboratory facilities for diagnosis by urine, blood, blood serum, sputum, gastric juice, duodenal tube and X-ray. Recreation hall with pool and billiards for free use of patients.

Rates include treatment, board, medical attention and general nursing. The Sanatorium is supplied from Pope Farm with vegetables, fruit, poultry, and eggs, also milk, cream, butter and buttermilk from its herd of registered Jerseys.

THE POPE SANATORIUM

Long Distance Phones CUMB. M. 2122 HOME 2122

(Incorporated Established 1890)

LOUISVILLE, KENTUCKY 115 West Chestnut St.

CHESTNUT LODGE

Rockville, Maryland

Near Washington, D. C. Baltimore & Ohio Railroad and Electric Line from Washington

This sanitarium under experienced management offers superior advantages for the treatment of patients suffering from Nervous and mild Mental Diseases, and for elderly persons needing skilled care and nursing; combining the equipment of a modern Phycopathic Hospital with the appointments of a refined home. The Hydrotherapy Department is complete in every detail including the Nauheim Baths for Arterioscierosis, Heart and Kidney Diseases.

DR. E. L. BULLARD, Physician-In-Charge

THE DAVIS INFIRMARY

J. D. S. DAVIS, M. D.

BIRMINGHAM - - - ALABAMA

FOR SURGICAL AND GYNECOLOGICAL CASES AND HOSPITAL TRAINING SCHOOL FOR NURSES

APPALACHIAN HALL :—: ASHEVILLE, N. C.

DR. LOUIS G. BEALL
DR. BERNARD R. SMITH
Physicians in Charge
Miss V. E. Lively
Supt. of Nurses

AN INSTITUTION FOR THE TREATMENT OF NERVOUS DISEASES

ADVISORY BOARD
Dr. C. V. Reynolds
Dr. M. H. Fletcher
Dr. C. L. Minor
Dr. W. L. Dunn

We have recently erected two additional buildings, thoroughly equipped with every modern convenience, including a most complete Hydrotherapy Department.

Situated at an altitude of 2500 ft. in the heart of the Blue Ridge Mountains of Western North Carolina. Superb lawn and 25 acres of beautifully wooded grounds.

For information address DRS. BEALL & SMITH. ASHEVILLE, N. C.

THE WATAUGA SANITARIUM

RIDGETOP, TENNESSEE

19 Miles North of Nashville, Henderson Division of L. & N. Ry.

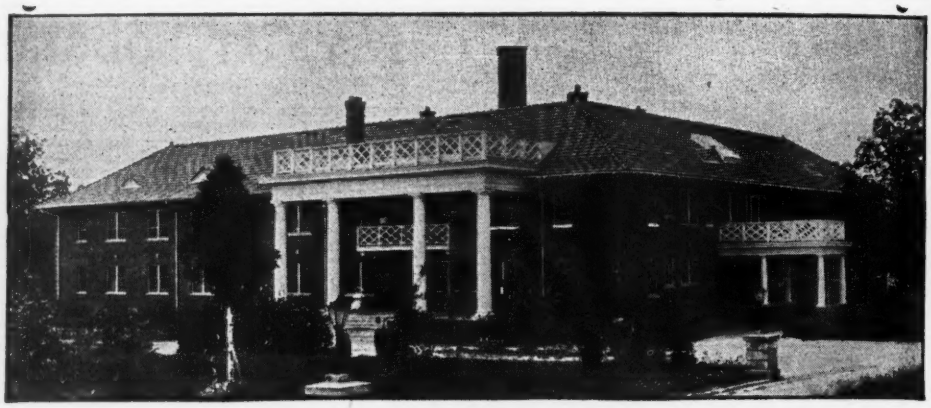
For Tuberculosis in Any Form

STAFF
Dr. Wm. Litterer
Dr. W. A. Bryan
Dr. O. N. Bryan
Dr. G. C. Savage
Dr. J. M. King
Dr. R. Boyd Bogle

LOCATION IDEAL, elevation 1,000 feet, buildings modern; hot and cold running water; lighted with gas; perfect sewerage and excellent water supply. The Sanitarium operates its own dairy and truck farms. Tuberculins and vaccines administered in suitable cases. **Rates very reasonable. X-Ray diagnosis. Heliotherapy modified after method of Rollier.**

THE WATAUGA SANITARIUM

Dr. C. A. ROBERTSON, Medical Director RIDGETOP, TENNESSEE



THE CHESTON KING SANITARIUM

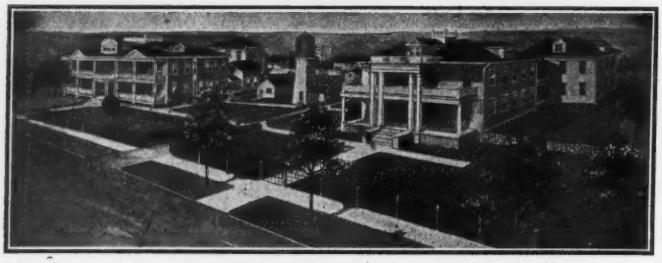
A Private Sanitarium for Nervous and Mental Diseases, Alcoholic and Narcotic Inebriety

Careful attention to proper classification of cases. Modern conveniences and accommodations. Facilities excellent. Electricity, Hydrotherapy, Massage and Occupation. Site elevated, retired and beautiful. Twenty-five acres in lawn and garden. Situated between the Capital City Country Club and Greater Oglethorpe University. Patients admitted to our sanitarium can have all the rest and exercise indicated and yet will not come in contact with any objectionable case. A physician in constant attendance. Mail address

THE CHESTON KING SANITARIUM, Peachtree Road, Atlanta, Georgia

ARLINGTON HEIGHTS SANITARIUM

P. O. BOX 978, FORT WORTH, TEXAS



For Nervous Diseases, Selected Cases of Mental Diseases, Drug and Alcohol Addictions.

(Incorporated under Laws of Texas)

WILMER L. ALLISON, M.D.
Resident Physician
JAMES D. BOZEMAN, M.D.
Resident Physician
BRUCE ALLISON, M.D.
Resident Physician
JOHN S. TURNER, M.D.,
Consulting Physician

KENILWORTH SANITARIUM

KENILWORTH, ILLINOIS

(Established 1905)

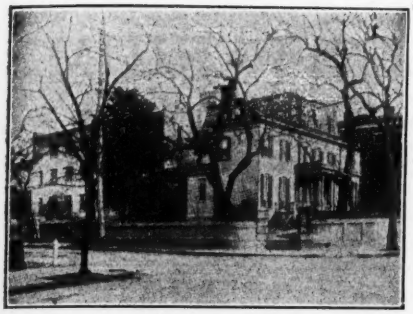
(C. & N. W. Railway. Six miles North of Chicago.)

Built and equipped for the treatment of nervous and mental diseases. Approved diagnostic and therapeutic methods.

An adequate night nursing service maintained. Sound proof rooms with forced ventilation. Elegant appointments. Bath rooms en suite, steam heating, electric lighting, electric elevator.

Resident Medical Staff:
Ella Blackburn, M.D. Sherman Brown, M.D.
Sanger Brown, M.D.

Chicago Office 59 East Madison Street
Telephone Rondolph 5794 Hours 11 to 1, by appointment only
All correspondence should be addressed to
Kenilworth Sanitarium Kenilworth, Ill.

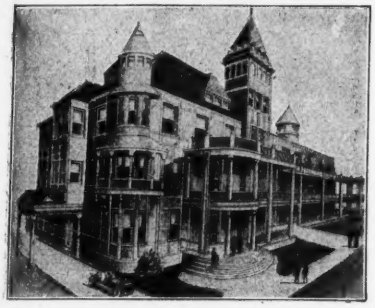


The Tucker Sanatorium, Inc.

Madison and Franklin Streets
RICHMOND, VIRGINIA

This is the Private Sanatorium of Dr. Beverley R. Tucker

The Tucker Sanatorium is for the treatment of nervous diseases. Insane and acute alcoholic cases are not taken. The Sanatorium is large and bright, surrounded by a lawn and shady walks and large verandas. It is situated in the best part of Richmond and is thoroughly and modernly equipped. There are departments for massage, medicinal exercises, hydrotherapy, occupation and electricity. The nurses are especially trained in the care of nervous cases.



HIGHLAND SANITARIUM Nashville Tennessee

FOR THE TREATMENT OF
Nervous and Mild Mental Disorders, General Invalidism and the Addictions

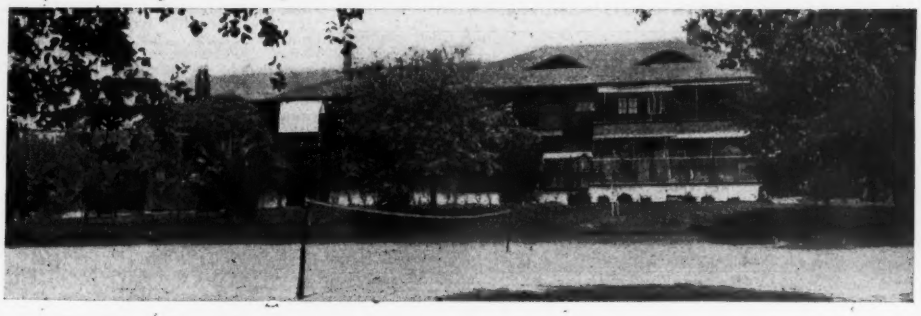
Under the Supervision of Dr. A. E. DOUGLAS, former Superintendent of the Central Tennessee State Hospital, assisted by a Staff of Fifteen of Nashville's Most Eminent Physicians.

Situated in the suburbs of Nashville, three miles from heart of city on Murfreesboro Pike in midst of 10 acres of beautiful blue grass woodland and ornamental shrubbery.

A quiet, homelike, strictly ethical, splendidly equipped hospital for patients of this character, operating under state license and in charge of a successful and widely known physician who has given his entire professional life to the study of ways and means of relieving and curing these unfortunates.

Number of patients limited, assuring personal attention of Superintendent. Special facilities installed at an enormous cost for giving hydrotherapy, electrotherapy, massage, baths and rest treatment. Address:

HIGHLAND SANITARIUM
Telephone Main 1826 R. F. D. 7, Nashville, Tenn.



LAS ENCINAS Pasadena, Calif.

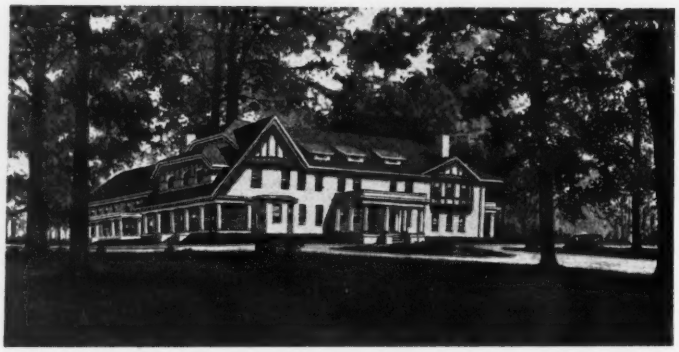
A Sanitarium for the Treatment of General and Nervous Diseases

BOARD OF DIRECTORS: Norman Bridge, M. D., Pres.; H. G. Brainerd, M. D., Vice-Pres.; W. Jarvis Barlow, M.D.; J. H. McBride, M. D.; F. C. E. Mattison, M. D.

BEAUTIFULLY located in the country, two miles from Pasadena. Ground comprising natural live-oak grove of 20 acres, with lawns and gardens, ideally adapted to rest and enjoyment. Large central building and cottages all modernly equipped, homelike and comfortable. Light, airy rooms with or without private bath and sleeping-porch. Physicians and nurses in constant attendance. Hydrotheraphy, Electrotheraphy, Massage and the most approved modern medical and hygienic methods employed. Careful individualization of treatment. Patients educated to correct physical and mental habits. Rigid dietetic supervision and unexcelled table. Adequate dairy and poultry-plant. No Tuberculosis, Epilepsy or Insanity received.

Address, Stephen Smith, Medical Director, Pasadena, Calif.

LYNNHURST SANITARIUM



A HIGH-CLASS INSTITUTION FOR NERVOUS DISEASES, MILD MENTAL DISORDERS AND DRUG ADDICTION.

Situated in the suburbs of Memphis on 28 acres of beautiful woodland and ornamental shrubbery. Modern and approved methods in construction and equipment. Thorough ventilation, sanitary plumbing, low pressure steam heat, electric light, fire protection, and an abundance of pure water. Special facilities for giving Hydrotherapy, Electrotherapy, Massage, Physical Culture and Rest Treatment. Experienced nurses and house physician. An improved treatment for Opium-Morphin addiction.

S. T. RUCKER, M.D., Director Medical Dep't.

Memphis, Tenn. Bell Telephone Connections

THE POTTENGER SANATORIUM

FOR DISEASES OF THE LUNGS AND THROAT

MONROVIA, CALIFORNIA

A thoroughly equipped institution for the scientific treatment of tuberculosis. High class accommodations. Ideal all-year-round climate. Surrounded by orange groves and beautiful mountain scenery. Forty-five minutes from Los Angeles. F. M. Pottenger, A.M., M.D., LL.D., Medical Director. J. E. Pottenger, A.B., M.D., Assistant Medical Director and Chief of Laboratory. George H. Evans, M.D., San Francisco, Medical Consultant. For particulars address:

POTTENGER SANATORIUM,
Monrovia, California

Los Angeles Office: 1100-1101 Title Ins. Bldg., Fifth and Spring Streets

WAUKESHA SPRINGS SANITARIUM

For the Care and Treatment of

NERVOUS DISEASES

Building Absolutely Fireproof

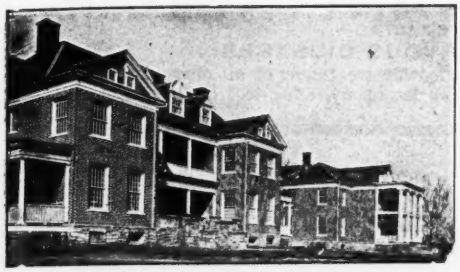
BYRON M. CAPLES, M. D., Supt.

Waukesha, - - - - Wisconsin

J. C. KING, M.D.
GUY B. DENIT, M.D.

ST. ALBANS SANATORIUM, Inc.

Long Distance Phone 75
P. O. BOX 84
RADFORD, VIRGINIA



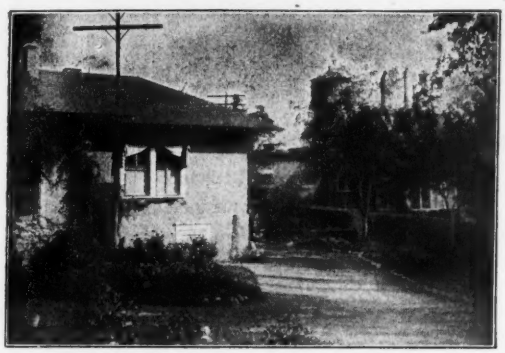
The Hydrotherapy Department is complete in every detail. Continuous, Nauheim and Tonic Baths.

Special emphasis given to Rest, Diet, Occupation, Massage and Electricity.

Clinical Laboratory fully equipped.

A thoroughly equipped and modern Private Sanatorium for the diagnosis and treatment of chronic medical, nervous, and mild mental disorders. It is situated 2,000 feet above sea level in the famous blue grass region of Virginia. There are two large colonial brick buildings connected by a sun parlor 105 feet long. Rooms single or en suite, with or without private baths. Accommodations for fifty patients. Modern and approved methods used in every department. The nurses are specially trained to care for nervous patients.

For details write for descriptive pamphlet.



New Mexico Cottage Sanatorium
SILVER CITY, NEW MEXICO
For the treatment of
TUBERCULOSIS

THE U. S. GOVERNMENT IS DOUBLING THE CAPACITY OF FORT BAYARD, its million and a half dollar sanatorium, nine miles from Silver City. This is indeed the Government endorsed region, no dust, no mosquitoes, 300 to 325 days of sunshine, low humidity, moderate winters, wonderfully cool summers, 6000 feet altitude. "Chasing the Cure" is a pleasure in this climate. We offer treatment in a modern, up-to-date institution with physicians in constant attendance day and night. Monthly reports made to home physicians. Rates moderate, no extras for ambulant patients. Write for booklet C.

E. S. BULLOCK, M.D. Physician-in-Charge
WAYNE MacVEAGH WILSON, Manager

City View Sanitarium

(Established 1907)
JOHN W. STEVENS, M.D.,
Physician-in-Charge
Telephone Main 2928
Rural Route No. 1 Nashville, Tennessee

For the Treatment of MENTAL and NERVOUS DISEASES and ADDICTIONS.

New Fifty-Room Department completed January, 1915. Now have two new buildings. One for each sex. A thoroughly modern and fully equipped private hospital, operating under state license. Large commodious buildings offering accommodations to meet the desires of the most exacting. Situated out of town in a quiet, secluded place. Large shady grounds. Specially trained nurses. Two resident physicians. Capacity 65. References: Medical Profession of Nashville.

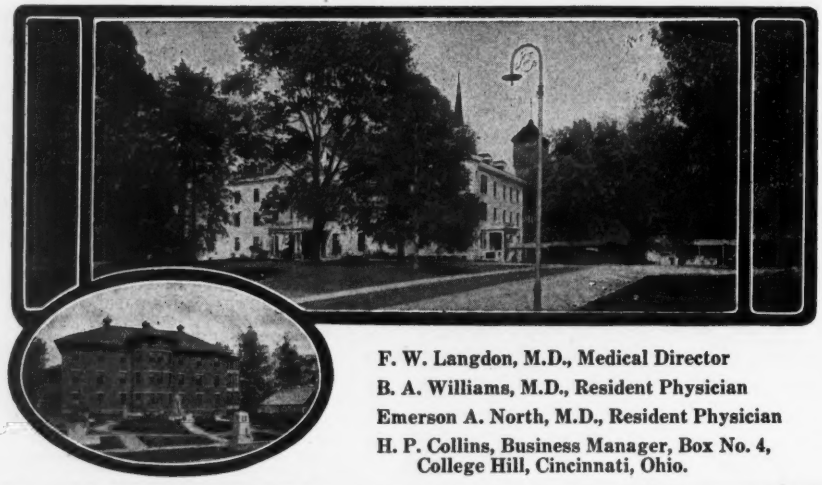
Patronize our advertisers—mention the Journal when you write them.

CINCINNATI SANITARIUM

INCORPORATED 1873

FOR MENTAL AND NERVOUS DISEASES

A strictly modern hospital fully equipped for the scientific treatment of all nervous and mental affections. Situation retired and accessible. For details write for descriptive pamphlet.



F. W. Langdon, M.D., Medical Director

B. A. Williams, M.D., Resident Physician

Emerson A. North, M.D., Resident Physician

H. P. Collins, Business Manager, Box No. 4, College Hill, Cincinnati, Ohio.

OCONOMOWOC HEALTH RESORT

OCONOMOWOC WISCONSIN

New Building Absolutely Fireproof

For Nervous and Mild Mental Diseases and Addiction Case

Five minutes walk from Interurban between Oconomowoc and Milwaukee on main line C. M. & St. P. Ry. 30 miles west of Milwaukee

Built and equipped to supply the demand of the neurasthenic, border-line and undisturbed mental case, for a high-class home free from contact with the palpably insane, and devoid of the institutional atmosphere.

Forty-one acres of natural park in the heart of the famous Wisconsin Lake Resort region. Rural environment, yet readily accessible. A beautiful country in which to convalesce.

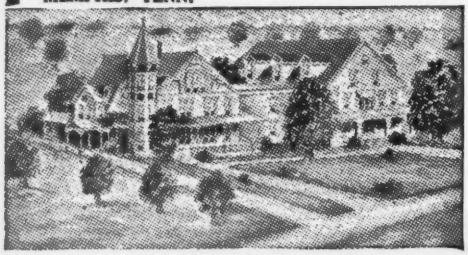
The new building has been designed to encompass every requirement of modern sanitarium construction, the comfort and welfare of the patient having been provided for in every respect. The bath department is unusually complete and up-to-date.

Number of patients limited, assuring the personal attention of the resident physician in charge.

Arthur W. Rogers, B.L., M.D., Resident Physician in Charge

PETTEY & WALLACE SANITARIUM

958 S. Fifth Street
MEMPHIS, TENN.



FOR THE TREATMENT OF

Drug Addictions, Alcoholism, Mental and Nervous Diseases

A quiet, home-like, private, high-class institution. Licensed. Strictly ethical. Complete equipment. Best Accommodations.

Resident physicians and trained nurses.

Drug patients treated by Dr. Pettey's original method.

Detached building for mental patients.

RADIUM THERAPY

in connection with

NEWELL & NEWELL Sanitarium

705-707 Walnut St., Chattanooga, Tenn.

An ample supply of Radium for the treatment of all conditions in which Radium is indicated.

SANITARIUM STAFF

E. T. Newell, M.D.
E. D. Newell, M.D.
G. P. Haymore, M.D.
J. H. St. John, M.D.

TUBERCULOSIS

ALBUQUERQUE, NEW MEXICO

Climatic Conditions Unsurpassed. Altitude 5000 feet. In the LAND OF SUNSHINE. Experienced Medical Supervision. Trained Nurses in Constant Attendance. All Approved Therapeutic Measures Employed.

The Murphey Sanatorium

A High-Class Institution for the Treatment of Tuberculosis. Forty rooms—Ten with private bath—Thirty with bath between each two rooms. Every Room has a Private Sleeping Porch. Located in the midst of beautiful Mountain Scenery. Descriptive Booklet and full information mailed on request.

Rates $18.50 to $35.00 per week. No extras

THE MURPHEY SANATORIUM

ALBUQUERQUE, NEW MEXICO

W. T. MURPHEY, M.D., Consultant — DAVID A. SPEAR, M.D., Medical Director

MRS. HATTIE SOWER, Supt.

Glenwood Park Sanitarium, Greensboro, North Carolina.

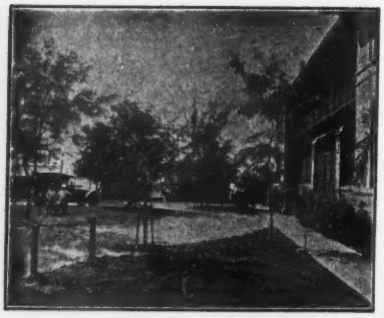
SUCCEEDING TELFAIR SANITARIUM

The Glenwood Park Sanitarium is ideally located in a quiet suburb of Greensboro, having all the advantages of the city, yet sufficiently isolated to enable our patients to enjoy restful quietude and entire freedom from the noise and distractions incident to city life.

CLASS OF PATIENTS—Those who need help to overcome the bondage of habit. Rest from overwork, study or care. Diversion for the depressed and disquiet mind—and such as are suffering from any disease of the nervous system. The treatment consists of the gradual breaking up of injurious habits, and the restoration to normal conditions, by the use of regular and wholesome diet, pure air, sunlight, and exercise, with such other remedies as are calculated to assist nature in the work of restoration.

Special attention is given to the use of electricity. Twenty years' experience has proven it invaluable in cases of nervous prostration, incipient paralysis, insomnia, the opium and whiskey habits, and those nervous affections due to uterine or ovarian disorders.

For further particulars and terms, address W. C. ASHWORTH, M. D., Superintendent.



Shortle's Albuquerque Sanatorium

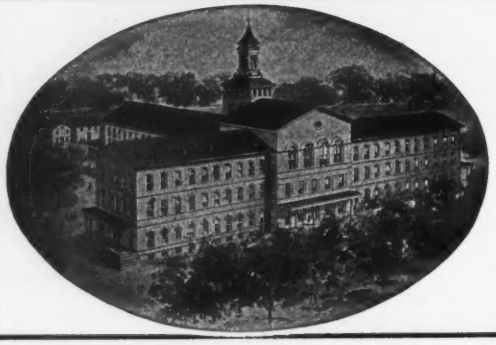
FOR TUBERCULOSIS

ALBUQUERQUE, - - NEW MEXICO

Altitude 5,100 Feet. Rates Moderate. Climatic Conditions Unsurpassed

A private sanatorium where the closest personal attention is given each patient. Complete laboratory and X-Ray equipment for diagnostic purposes. Compression of the lung and sun-bath treatment after the method of Rollier. Steam heat, hot and cold water, electric lights, call bells, local and long distance telephones and private porches for each room. Bungalows if desired. Situated but 1 1-2 miles from Albuquerque, the largest city and best market of New Mexico, permits of excellent meals and service at moderate price. Write for Booklet B.

A. G. Shortle, M.D., Medical Director



OXFORD RETREAT

OXFORD, OHIO

Nervous and Mental Diseases
Alcohol and Drug Addictions

FOR MEN AND WOMEN

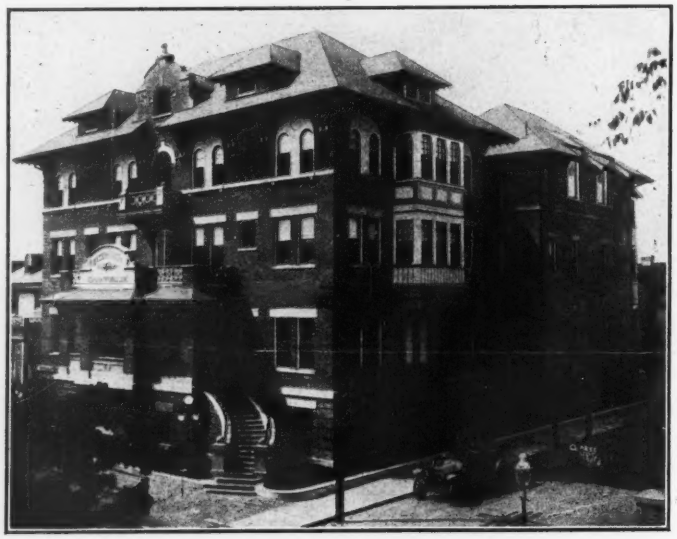
96 Acre Lawn and Forest. Buildings Modern and First Class in all Appointments. Thoroughly Equipped. Of Easy Access—39 Miles From Cincinnati, on C. H. & D. R. R. 10 Trains Daily.

THE PINES

An Annex for Nervous Women

Write For Descriptive Circular

R. HARVEY COOK, M.D., Physician-in-Chief



The Baker Sanatorium

Colonial Lake
Charleston, S. C.

A new and thoroughly equipped hospital for the care of Surgical patients.

ARCHIBALD E. BAKER, M.D.
Surgeon in Charge

HIGH OAKS---Dr. Sprague's Sanatorium

Nervous and mental diseases and liquor and drug addictions treated. Constant medical oversight and skilled nursing. New buildings, a complete hydro-therapeutic equipment, electricity, vibration, massage and all other approved methods of treatment. Sanatorium situated just outside the city limits, a half mile south of former location, on same street, South Broadway. Physicians wishing to send patients may telephone at Sanatorium's expense.

Address GEORGE P. SPRAGUE, M. D., Lexington, Kentucky

Westbrook Sanatorium, Richmond, Virginia

THROUGH THE MEDICAL STAFF,

DOCTORS JAS. K. HALL, P. V. ANDERSON AND E. M. GAYLE

WISHES TO ANNOUNCE TO THE PROFESSION THE OPENING ON NOVEMBER FIFTEENTH OF AN ADDITION TO THE INSTITUTION OF TWO BRICK BUILDINGS—ONE FOR MEN AND ANOTHER FOR WOMEN.

THE PLANT now consists of nine separate buildings situated in the midst of grounds which embrace eighty-five acres. The lawn is large and beautifully shaded; there are private walks and drives, and the institution affords the quietness and serenity of the country within sight of the city.

Rooms may be had single or en suite, with or without private baths. Small cottages, suitable for one patient, are also available.

Treatment is limited to Nervous Disorders, Mild Mental Affections, and to Alcoholic and Drug Habituation. Nurses and attendants are trained for this special work and the Sanatorium furnishes every facility for the rational treatment of such patients.

Life in the out-of-doors, combined with properly selected work for each patient, constitutes an important therapeutic measure.

The three physicians live at the Sanatorium and devote their entire attention to the patients.

BOOKLET UPON REQUEST

The Radium Institute of New Orleans

In Connection With

TOURO INFIRMARY

DIRECTING BOARD

Dr. S. M. D. Clark Dr. H. S. Cocram Dr. W. Kohlmann
Dr. U. Maes Dr. E. D. Martin Dr. R. Matas
Dr. F. W. Parham Mr. A. B. Tipping

For the treatment of conditions in which the use of Radium is indicated.

All correspondence should be addressed to the Radium Institute.

DR. E. C. SAMUEL, Radio-Therapist. A. B. TIPPING, Secretary.

The Thompson Sanatorium

Successor to the Mountain Park Sanatorium
KERRVILLE, TEXAS

For the Treatment and Education of Tuberculous Patients

Seventy-five miles northwest, and twelve hundred feet higher than San Antonio. Very dry the year round. Mild winters, cool, breezy summers. Hospital building and hollow tile cottages with modern conveniences. Beautiful mountain scenery. Prices moderate. Trained nurses.

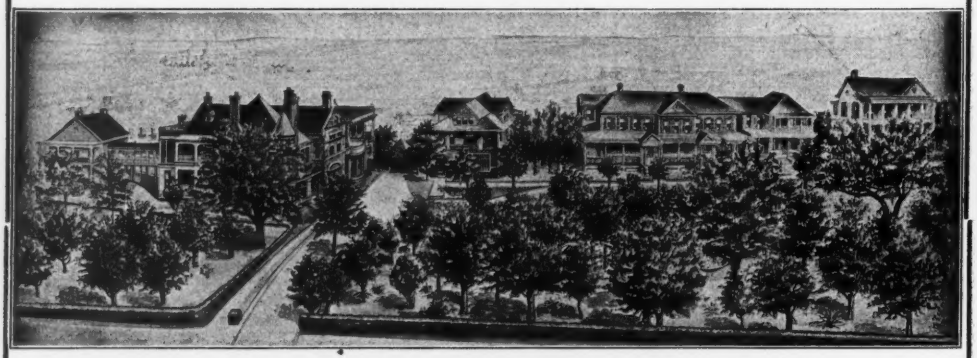
SAM E. THOMPSON, M.D.
(Former Medical Director of State Tuberculosis Sanatorium at Carlsbad)
Superintendent and Medical Director

DOWNEY HOSPITAL

A new, modern, up-to-date two-story building with roof garden, equipped with steam heat, electric lights, electric signal system and new furnishings. All rooms outside, with or without private bath; hot and cold water in each. Fully equipped sterilizing and operating rooms. Patients admitted suffering from Gynecological, Obstetrical, Abdominal and General Surgical conditions. Limited number of medical cases accepted. No contagious, alcoholic or mental cases admitted. Trained graduate nurses and excellent training school. For further information, address DOWNEY HOSPITAL, Gainesville, Ga.

DR. MOODY'S SANITARIUM

SAN ANTONIO, TEXAS



For Nervous and Mental Diseases, Drug and Alcohol Addictions and Nervous Invalids Needing Rest and Recuperation

Established 1903. Strictly ethical. Location delightful summer and winter. Approved diagnostic and therapeutic methods. Modern clinical laboratory. 7 buildings, each with separate lawns, each featuring a small separate sanitarium, affording wholesome restfulness and recreation, in doors and out doors, tactful nursing and homelike comforts. Bath rooms en suite, 100 rooms, large galleries, modern equipments, 15 acres, 350 shade trees, cement walks, playgrounds. Surrounded by beautiful park, Government Post grounds and Country Club.

G. H. MOODY, M. D., Supt. T. L. MOODY, M. D., Res. Physician J. A. McINTOSH, M. D., Res. Physician

SQUIBB'S MINERAL OIL

called

Liquid Petrolatum Squibb

Heavy (Californian)

Specially refined under our control and exclusively for us only by the *Standard Oil Company* of *California* which has no connection with any other Standard Oil Company

THE QUALITY MINERAL OIL. SPECIALLY REFINED FOR INTERNAL USE. IS A PURE, COLORLESS, ODORLESS, TASTELESS MINERAL OIL OF THE NAPHTHENE SERIES, INERT AND HIGHLY RESISTANT TO CHEMICAL CHANGE. IT THEREFORE MAY BE PRESCRIBED FOR YOUNG OR OLD IN ANY SIZE DOSE INDICATED.

E. R. Squibb & Sons, 80 Beekman Street, New York City, N. Y.

Dr. Brawner's Sanitarium

ATLANTA, GEORGIA

For Nervous and Mental Diseases, General Invalidsim and Drug Addictions

The sanitarium is located on the Marietta trolley line, 10 miles from center of city, near a beautiful suburb, Smyrna. Grounds consist of 80 acres. Buildings are steam heated, electrically lighted, and many rooms have private baths. Patients have many recreations such as tennis, croquet, baseball and automobiling. Reference: The Medical Profession of Atlanta. Address

Dr. JAS. N. BRAWNER,

701-2 Grant Bldg. Atlanta, Ga.

DR. BARNES' SANITARIUM

STAMFORD, CONNECTICUT

A Private Sanitarium for Mental and Nervous Diseases. Also Cases of General Invalidism. Separate Department for cases of inebriety.

The buildings are modern, situated in spacious and attractive grounds, commanding superb views of Long Island Sound and surrounding hill country. The accommodations, table, attendance, nursing and all appointments are first class in every respect. The purpose of the Institution is to give proper medical care and the special attention needed in each individual case. 50 minutes from Grand Central Station, New York. For terms and illustrated booklet, address F. H. BARNES, M.D., Med. Supt., Telephone 1867.

Medical College of Virginia

UNIVERSITY COLLEGE OF MEDICINE
MEDICAL COLLEGE OF VIRGINIA
(Consolidated)

Medicine-Dentistry-Pharmacy

STUART McGUIRE, M.D., Dean

New college building, completely equipped and modern laboratories. Extensive Dispensary service. Hospital facilities furnish 400 clinical beds; individual instruction; experienced faculty; practical curriculum. For catalogue or information address

J. R. McCAULEY, Secretary

1140 E. Clay Street Richmond, Virginia

Medical College of The State of South Carolina. Schools of Medicine and Pharmacy

Owned and controlled by the State

RATED IN CLASS A by the Council on Medical Education of the American Medical Association. Member of the Association of American Medical Colleges and of the American Conference of Pharmaceutical Faculties.

A LEADER IN MEDICAL EDUCATION
in the South

New building with well equipped laboratories. A full corps of efficient all-time teachers.

Located opposite the Roper Hospital and very near the Charleston Museum, thus affording the students more extensive opportunities for research and training.

REQUIREMENTS FOR ADMISSION to the Medical School are a diploma or certificate from a four year high school which requires not less than 14 units for graduation, and in addition to this two years of college work. The two years of college work must include credits for one year's work in physics, biology, chemistry and a modern foreign language.

WOMEN ADMITTED
On the same terms as men

SESSION OPENS SEPTEMBER 27, 1918
For Catalogue address

H. GRADY CALLISON, Registrar

Calhoun and Lucas Streets

CHARLESTON S. C.

Emory University, School of Medicine

(ATLANTA MEDICAL COLLEGE)

Sixty-fourth Annual Session begins September 23rd, 1918

ADMISSION: Completion of four-year course at an accredited high school, which requires not less than 14 units for graduation, and in addition, two years of college credits in Physics, Biology, Inorganic Chemistry, and German or French. The pre-medical course will be given in the College of Liberal Arts at Oxford, Ga. Admission to the pre-medical course may be obtained by presenting credentials of 14 units of high school work.

COMBINATION: A student may enter the regular Freshman Class on 14 units and attend the College of Liberal Arts for two years, after which he will be admitted to the Freshman Medical Class, and upon the completion of his Sophomore year in the Medical College, can obtain the degree of Bachelor of Science, gaining his M.D. degree after another two years at the Medical College.

INSTRUCTION: Thorough laboratory training and systematic clinical teaching are special features of this institution. The faculty is composed of 106 professors and instructors, twelve of whom are full-time salaried men.

EQUIPMENT: Five large new modern buildings devoted exclusively to the teaching of medicine, well equipped laboratories, and reference library.

HOSPITAL FACILITIES: The Grady (municipal) Hospital of 250 beds is in charge of the members of the medical faculty during the entire college session, and the Senior Students (in small sections) are given daily clinical and bedside instruction there. In the near future, work will begin on the new Wesley Memorial Hospital (of 200 beds) at a cost of not less than $200,000.00, which will be erected on or near the site of the present Medical College. The wards of this hospital, when completed, will be under the complete control of the faculty for teaching purposes. The J. J. Gray Clinic, which has just been completed at a cost of $85,000.00, will afford ample accommodations for this large clinic, and excellent facilities for clinical instruction.

RATING: This college is rated as a Class A Medical school by the Council on Medical Education of the American Medical Association, and is a member of the Association of American Medical Colleges.

Catalog giving full information, also entrance blanks, will be sent by applying to WM. S. ELKIN, A.B., M.D., Dean.

UNIVERSITY OF MARYLAND, SCHOOL OF MEDICINE
AND
COLLEGE OF PHYSICIANS AND SURGEONS

Requirements for Admission—Two years of college work, including modern languages, Chemistry, Biology and Physics, in addition to an approved four year high school course.

Facilities for Teaching—Abundant laboratory space and equipment. Three large general hospitals absolutely controlled by the faculty and thirteen hospitals devoted to specialties, in which clinical teaching is done.

The next regular session will open October 1, 1918.

For catalogue apply to J. M. H. Rowland, M.D., Dean, N. E. Cor. Lombard and Greene Sts. Baltimore, Md.

LOYOLA POST-GRADUATE SCHOOL OF MEDICINE

New Orleans, La.

Combining New Orleans Post-Graduate School of Medicine.
Louisiana Post-Graduate School of Medicine.

Offers courses in all branches of medicine and surgery.
Special facilities for courses in the Eye, and the Ear, Nose and Throat.
Faculty numbering over eighty.
Unlimited clinical material in all the hospitals of New Orleans, the medical metropolis of the South.
Students admitted to all courses throughout the year.

JAMES M. BATCHELOR, M.D., President. **JOSEPH A. DANNA, M.D., Secretary.**

Address all Communications to the Secretary, Suite 716 Maison Blanche Bldg., New Orleans, La.

Patronize our advertisers—mention the Journal when you write them.

New York Polyclinic Medical School and Hospital

341-351 West 50th Street, New York City

General, Separate Clinical and Special Post-Graduate Courses of Individual Instruction given throughout the year, beginning at any time, and for any period of time. *Laboratory, Cadaver and Operative Courses* in all branches. Instruction planned to meet individual requirements. *Courses of Practical Work* under tutelage for periods of three months, six months, one year, for specialists. *Individual Instruction* in the following branches:

Major and Minor Surgery
Hernia (local anesthesia)
Cystoscopy (male and female)
Urethroscopy and Endoscopy
Neurology and Neurological Surgery (brain, spinal cord, peripheral nerves)
Dermatology (skin pathology)
Gynecology (operative; non-operative)
Eye, (including Refraction), Ear, Nose, Throat
Rectal Diseases
Anesthesia
Physical Diagnosis
Infant Feeding and Diagnosis
Tuberculosis (pulmonary, glandular, bone)
Drug Addictions and Toxemias
Diseases of Stomach (dietetics)
X-Ray and Electro Therapeutics

State particular information desired when writing.

Address inquiries to JOHN A. WYETH, M.D., LL.D., President of the Faculty

University of Georgia
Medical Department
Augusta, Ga.

ENTRANCE REQUIREMENTS: The successful completion of at least two years of work including English, Physics, Chemistry, and Biology in an approved College. This in addition to four years of high school.

INSTRUCTION: The course of instruction occupies four years, beginning the second week in September and ending the first week in June. The first two years are devoted to the fundamental sciences, and the third and fourth to practical clinic instruction in medicine and surgery. All the organized medical and surgical charities of the City of Augusta and Richmond County, including the hospitals, are under the entire control of the Board of Trustees of the University. This arrangement affords a large number and variety of patients which are used in the clinical teaching. Especial emphasis is laid upon practical work both in the laboratory and clinical departments.

TUITION: The charge for tuition is $150.00 a year except for residents of the State of Georgia, to whom tuition is free.

For further information and catalogue address

The Medical Department
University of Georgia
Augusta, Ga.

Vanderbilt University School of Medicine

Next Session Opens October 1, 1918

Course of instruction covers a period of four years, first two of which are devoted to the fundamental sciences in which practical work in the laboratory is emphasized, and the third and fourth years to practical clinical teaching in Medicine, Surgery and the specialties.

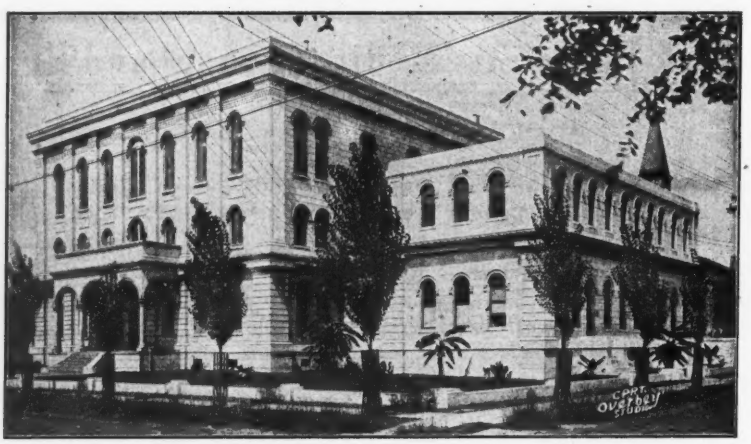
Requirements for Admission:

A four-year high school course, covering at least fourteen units, or its equivalent, and two years of college work (60 semester hours), which must include Chemistry, Physics, Biology, English Composition and a modern foreign language.

For further particulars and information address

B. F. HAMBLETON, M.D.,
Acting Dean and Secretary
School of Medicine
Vanderbilt University Nashville, Tennessee

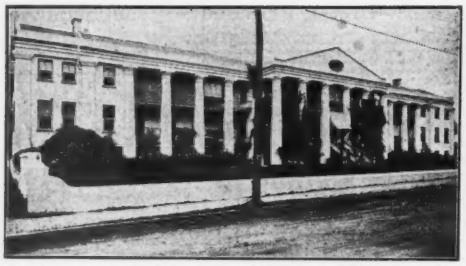
Patronize our advertisers—mention the Journal when you write them.



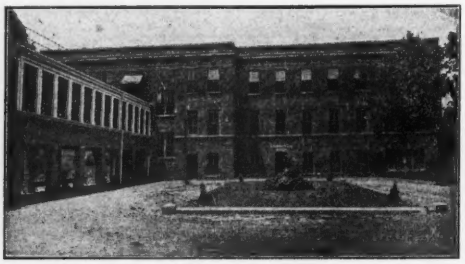
University of Alabama, School of Medicine

MOBILE, ALABAMA

Rated Class A. Registered "Standard" by N. Y. State Educational Department. Laboratories of Anatomy, Physiology, Biology, Bacteriology, Pathology and Pharmacology. Equipped with latest standard apparatus. Operated by all-time Teachers. Instruction in Junior and Senior years mostly clinical. Below are shown four of the Institutions affiliated with us for clinical work.

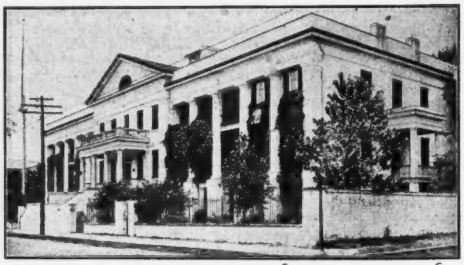


Mobile City Hospital
206 beds. Internes appointed and controlled by the School. Clinical material abundant, studied by classes divided into small sections under all-time teacher.



Mobile City Dispensary
Controlled and operated by the School. Over 10,000 patients treated by students last session. Under direction of experienced teachers.

Alabama Maternity and Infant Home
Mobile, Ala. Capacity, 10 maternity cases and 100 infants. Professors of Obstetrics and Pediatrics control.



U. S. Marine Hospital
Mobile, Ala.. Surgeon in charge Professor of Tropical Medicine in the College. Patients utilized by order of Secretary of the Treasury of United States.

For entrance requirements and full information address DR. T. H. FRAZER, Dean, Mobile, Ala.

Tulane University of Louisiana

COLLEGE OF MEDICINE

(Established in 1834)

School of Medicine—

After January 1, 1918, all students entering the Freshman Class will be required to present credits for two years of college work, which must include Biology, Chemistry and Physics, with their laboratories, and one year in German or French.

Graduate School of Medicine—

A school for physicians desiring practical clinical opportunities, review, laboratory technic or cadaveric work in surgery or gynecology. Excellent facilities offered in all special branches.

School of Pharmacy—

Admission: Three years of high school work, or 12 units. Two years for Ph.G. degree. Three years for Ph.C. degree.

School of Dentistry—

Admission: Four years of high school work, with 15 units. Thorough, practical, as well as comprehensive technical training in dentistry.

Women admitted to all Schools on the same terms as men.

For catalogs and all other information, address

TULANE COLLEGE OF MEDICINE

P. O. BOX 770, NEW ORLEANS, LA.

NEW ORLEANS POLYCLINIC

GRADUATE SCHOOL OF MEDICINE, TULANE UNIVERSITY OF LOUISIANA
Thirty-second Annual Session opens Sept. 23, 1918, and closes June 7, 1919

Physicians will find the Polyclinic an excellent means for posting themselves upon modern progress in all branches of medicine and surgery, including laboratory and cadaveric work. Special attention given to military matters. For further information, address:

CHARLES CHASSAIGNAC, M. D., Dean

Post Office Drawer 770 **NEW ORLEANS**

Tulane also offers highest class education leading to degrees in Medicine, Pharmacy, Dentistry, Hygiene and Tropical Medicine

The Chicago Policlinic and The Post Graduate Medical School of Chicago

AFFILIATED

Offer the Following Courses:

CLINICAL INSTRUCTIONS in all departments of medicine and surgery. Clinical and Personal Courses in Eye, Ear, Nose and Throat.
SPECIAL PERSONAL COURSES in Surgery and Gynecology (operating room work included), Operative and Experimental Surgery on Cadaver and Dog.
PRACTICAL LABORATORY COURSES in Bacteriology, Blood, Urine, Sputum, Feces, Stomach Contents. Internship for those desiring hospital experience.
PRIVATE COURSES in any subject desired, besides the private courses in small classes outlined in the book of information.
LARGE DISPENSARY CLINICS. Three Hospitals. Two training schools for nurses. For further information write either:

The Chicago Policlinic
M. L. Harris, M.D., Stc'y.
Dept. R, 219 West Chicago Ave.

The Post-Graduate Medical School of Chicago
Emil Ries, M.D., Sec'y.
Dept. R, 2400 S. Dearborn St.

This Complete Office Outfit
$75.00
Write for full description
Frank S. Betz Co., Hammond, Indiana
Chicago Sales Dept. 30 East Randolph Street

Stanolind

Reg. U. S. Pat. Off.

Surgical Wax

For use in the hot wax treatment of burns, surgical wounds and similar lesions.

It is unapproached in purity and may be applied without incorporating with it any therapeutic agent.

Many advanced workers advocate its use in that manner.

However, surgeons may use it as a base for any of the published formulas, and may be assured that it is the purest and best wax that modern science can produce.

It conforms to the requirements of the Council of Pharmacy and Chemistry of the American Medical Association.

Stanolind Petrolatum

In Five Grades

"Superla White" is pure, pearly white, all pigmentation being removed by thorough and repeated filtering.

"Ivory White," not so white as Superla, but compares favorably with grades usually sold as white petrolatum.

"Onyx," well suited as a base for white ointments, where absolute purity of color is not necessary.

"Topaz" (a clear topaz bronze) has no counterpart—lighter than amber—darker than cream.

"Amber" compares in color with the commercial grades sold as extra amber—somewhat lighter than the ordinary petrolatums put up under this grade name.

STANDARD OIL COMPANY

(Indiana)

Manufacturers of Medicinal Products from Petroleum

910 S. Michigan Avenue Chicago, U. S. A.

762

American Made "Salvarsan"

(Arsphenamine)

[Dioxydiaminoarsenobenzene Dihydrochloride]

(Ehrlich's "606")

THE Federal Trade Commission has granted license for "Arsphenamine." Under this license we are producing the product identical in every way with the *Salvarsan* which we formerly imported and which conforms in every detail to the standards set by the late Professor Dr. Paul Ehrlich, and is made according to the processes used at the Hoechst works.

In addition to the tests prescribed and made by the Hygienic Laboratory of the Public Health Service, our product is tested by the head of the Department of Biological Chemistry in one of our leading university medical schools, who bears the same judicial attitude to our preparations that Prof. Ehrlich did to the standard German preparations. He subjects them to biological tests, in addition to those prescribed by the Public Health Service, which are more rigorous and comprehensive than those adopted for this purpose by Professor Ehrlich himself. These tests are made and reported upon before the product is submitted to the United States Public Health Service, thus insuring a double and absolute check on every lot turned out.

Our product is being marketed under the name *"Salvarsan."* As the product of other makers is being sold as "Arsphenamine" also, to insure receiving our product order either

SALVARSAN

or

ARSPHENAMINE--"METZ"

H. A. METZ LABORATORIES, Inc. - H. A. METZ, President

122 Hudson Street, NEW YORK

DENNETT $3.50
Simplified Infant Feeding
By ROGER H. DENNETT, B.S., M.D.
Adjunct Professor of Diseases of Children, New York Post-Graduate Medical School.
Octavo 355 pages. 14 illustrations. 75 Illustrative Cases

FUCHS $7.00
Text-Book of Ophthalmology
By DR. ERNST FUCHS
Translated by
ALEXANDER DUANE, M.D.
Surgeon Ophthalmic and Aural Institute, New York.
Octavo. 989 pages. 441 illustrations. 5th Edition.

SMITH $6.50
Metabolism
The Physiological and Pathological Chemistry of
By DR. OTTO VON FURTH
Translated by
ALLEN J. SMITH
University of Pennsylvania
Octavo. 635 pages.

KEIBEL & MALL $20.00
Human Embryology
Edited by FRANZ KEIBEL
Professor in University of Freiburg
And FRANKLIN P. MALL
Professor of Anatomy, Johns Hopkins University
Imperial Octavo. 1580 pages.
1081 illustrations. 2 volumes.

BEIFELD $5.00
The Basis of Symptoms
Krehl's Principles of Clinical Pathology
By DR. LUDOLPH KREHL
Translated by
ARTHUR FREDERIC BEIFELD Ph.B., M.D.
Octavo. 520 pages. 3d American Ed.

THOMAS and IVY $4.50
Applied Immunology
By B. A. THOMAS, A.M., M.D.
Professor of Genito-Urinary Philadelphia Polyclinic, and
R. H. IVY, M.D., D.D.S.,
Assistant Instructor in Surgery, University of Pennsylvania.
Octavo. 359 pages. 68 illustrations.

WHITE and MARTIN $7.00
Genito-Urinary Surgery and Venereal Diseases
By J. WILLIAM WHITE, M.D.
John Rhea Barton Professor of Surgery, University of Pennsylvania
And EDWARD MARTIN, M.D.
Professor of Clinical Surgery, University of Pennsylvania.
Octavo. 1100 pages. 325 text illustrations. 15 colored plates.
10th Revised Edition.

ELIASON $1.50
Practical Bandaging
Including Adhesive and Plaster-of-Paris Dressings
By ELDRIDGE L. ELIASON, A.B., M.D.
Assistant Instructor in Surgery, University of Pennsylvania.
Crown Octavo. 124 pages.
155 illustrations.

SADTLER and COBLENTZ $5.00
A Text-Book of Chemistry for Pharmaceutical and Medical Students
By SAMUEL P. SADTLER, Ph.D., LL.D.
Professor of Chemistry, Philadelphia College of Pharmacy, and
VIRGIL COBLENTZ, Ph.D., LL.D.
Professor of Chemistry, Columbia University.
Octavo. 749 pages. 141 illustrations. 5th Edition.

Piersol's Anatomy

1918 EDITION — NO INCREASE IN PRICE — BOTH NOMENCLATURES

DAVIS $7.00
Applied Anatomy
By GWILYM G. DAVIS, M.D.
Associate Professor of Applied Anatomy, University of Pennsylvania.
Octavo. 630 pages. 630 illustrations in colors and black. 4th Edition.

JORES $4.50
The Commoner Diseases, Their Causes and Effects
By LEONARD JORES, MARBURG,
Translated by
WILLIAM H. WOGLOM, M.D.
Asst. Professor, Columbia University
Octavo. 424 pages. 250 illustrations.

HARTZELL $7.00
Dermatology
By MILTON B. HARTZELL, A.M., M.D., LL.D.
Professor of Dermatology, University of Pennsylvania.
Octavo. 600 pages. 150 illustrations. 43 Colored Plates.

PIERSOL $3.50
Histology
By GEORGE A. PIERSOL, M.D.
Professor of Anatomy, University of Pennsylvania.
Octavo. 418 pages. 438 illustrations. 88 in colors. 10th Edition.

WOOD $4.50
A Text-Book of Pharmacology and Therapeutics
By HORATIO C. WOOD, JR., Professor of Pharmacology and Therapeutics, Medico-Chirurgical College.
Octavo. 429 pages. 28 illustrations.

HEISLER $5.00
Practical Anatomy
By JOHN C. HEISLER, M.D.
Professor of Anatomy, Medico-Chirurgical College, Philadelphia.
Octavo. 790 pages. 366 illustrations.
220 in color, water-proof

KERRISON $5.50
Diseases of the Ear
By PHILIP D. KERRISON, M.D.
Professor of Otology, New York Polyclinic.
Octavo. 512 pages. 315 illustrations.

MEDICUS $2.00
Qualitative Analysis
By LUDWIG MEDICUS.
Translated by
JOHN MARSHALL
Professor of Chemistry and Toxicology, University of Pennsylvania.
Octavo. 216 pages. 8th Edition.

FLAGG $4.00
Anesthesia
By PALUEL J. FLAGG, M.D.
Lecturer in Anesthesia, Fordham University.
Octavo. 341 pages. 136 illustrations.

ROBB $2.50
Aseptic Surgical Technique With Especial Reference to Gynecological Operations
By HUNTER ROBB, M.D.
Formerly Professor of Gynecology, Western Reserve Hospital.
Octavo. 292 pages. 44 text figures. 24 plates. 5th Revised Edition.

ROBERTS and KELLY $7.00
Fractures
By JOHN B. ROBERTS, M.D., F.A.C.S.,
Professor of Surgery in the Philadelphia Polyclinic, and
JAMES A. KELLY, A.M., M.D.
Associate in Surgery, Philadelphia Polyclinic.
Octavo. 704 pages. 918 illustrations.

SHEARS $6.00
Obstetrics
By GEORGE PEASLEE SHEARS, M.D.
Professor of Obstetrics, New York Polyclinic Medical School and Hospital.
Octavo. 640 pages. 300 illustrations.

J. B. LIPPINCOTT COMPANY

LONDON: *Since 1875.* 22 Henrietta St.
PHILADELPHIA: *Since 1792.* East Washington Square
MONTREAL: *Since 1897.* Unity Building

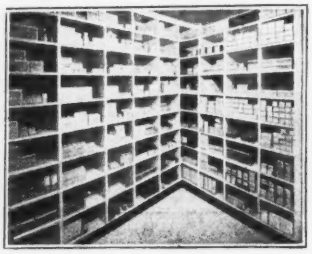
B. B. CULTURE

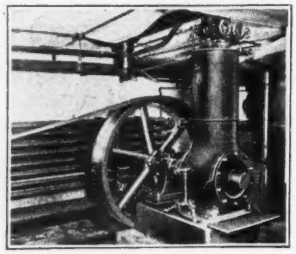
A pure liquid suspension of Bacillus Bulgaricus, issued in the 3-ounce size only, equally suited for internal and external use but particularly applicable at this season to cases of infant enterocolitis.

Why not give B. B. Culture a trial in your next "baby case?"

B. B. CULTURE LABORATORY
YONKERS, NEW YORK

VAN ANTWERP BUILDING


VIEW IN STORAGE


AMMONIA COMPRESSOR

Keeping Qualities *of* Biologicals Depend on Proper Storage

WE HAVE *The* LARGEST *and* MOST PERFECT BIOLOGICAL STORAGE IN THE SOUTH.

We Carry A Full Line of LEDERLE'S, MULFORD'S, PARKE-DAVIS and LILLY'S PRODUCTS

COMPLETE TWENTY-FOUR HOURS A DAY SERVICE

Your orders are Filled at any time of *The* Day or Night Received

VAN ANTWERP DRUG CORPORATION, MOBILE, ALA.
Order of Us—We Market Only Reliable Products

Wherever There's Pain and Inflammation There Summon

ATOPHAN

Although Atophan—formerly imported, but now manufactured by us in the U. S. A.—was practically unobtainable for nearly two years, few physicians will have forgotten its unique physiologic action and therapeutic efficacy in **Gout** and **Articular Rheumatism.**

It is the broader application of Atophan as a **Systemic Analgesic** and **Antiphlogistic** of strikingly prompt and enduring effect, non-depressant and safe, which may need recalling to your attention.

Whether the Pain be thought vaguely **"Rheumatic," "Neuralgic"** or distinctly that of **Neuritis, Migraine, Hemicrania, Lumbago** or **Sciatica,** let the Inflammatory Process be **Iritis, Laryngitis** with **Dysphagia,** or the burning and itching of **Eczema, Pruritis,** etc., Atophan is indicated for relief and treatment.

Information and Literature from

Schering & Glatz, Inc., 150 Maiden Lane New York

The Management of an Infant's Diet

A Temporary Diet in Summer Diarrhea

Mellin's Food . . 4 level tablespoonfuls
Water (boiled, then cooled) **. 16 fluidounces**
To be given in small amounts at frequent intervals.

Each ounce of this mixture has a food value of 6.2 Calories and furnishes immediately available nutrition well suited to spare the body-protein, to prevent a rapid loss of weight, to resist the activity of putrefactive bacteria, and to favor a retention of fluids and salts in the body tissues.

MELLIN'S FOOD COMPANY, BOSTON, MASS.

Patronize our advertisers—mention the Journal when you write them.

ACQUAINTANCE

Has been made by a large number of discriminating physicians with the "H. W. & D." products and almost without exception favorable comment follows this acquaintance.

The INTEREST of all physicians is sought upon the basis of therapeutic worth and proper ethical exploitation. The advertisement of our specialties in "The Southern Medical Journal," certifies that they conform to the rules of "The Council" A.M.A. for admission into New and Nonofficial Remedies.

INDICATIONS

Disturbed intestinal conditions
of putrefactive or fermentative origin in adults and children.

BULGARA TABLETS
(Bacilli Bulgarici)

Abnormal ovarian functionation
due to natural or surgical menopause or tardy development.

LUTEIN TABLETS
(Corpus Luteum)

Insufficient biliary secretion
especially when there is a thickening of the bile with simulation of gall stone symptoms.

GLYCOTAURO TABLETS
(Standardized Bile)

New diagnostic agents and appliances. Catalogue upon request.

THE HYNSON, WESTCOTT & DUNNING
PHARMACEUTICAL LABORATORY
BALTIMORE MARYLAND

Our facilities make us headquarters for the Organotherapeutic Agents

LABORATORY PRODUCTS

The Best costs no more than—

The physician will be pleased to learn that his patient can now get Armour's Corpus Luteum, Powder, 2- and 5-grain capsules and 2-grain tablets, at a reduction of approximately 33⅓% from former prices.

Corpus Luteum (Armour) is the true substance made from material selected in our own abattoirs, and will give results.

Pituitary Liquid (Armour), ½cc and 1cc ampoules, is free from preservatives. ½ cc obstetrical, 1cc surgical.

Armour's Surgical Catgut Ligatures
are smooth, strong and sterile. Sizes 000 to No. 6 inclusive. Plain and Chromic, 5-foot lengths. Emergency (20-inch lengths).

ARMOUR & COMPANY
CHICAGO

2415

Patronize our advertisers—mention the Journal when you write them.

SOUTHERN MEDICAL JOURNAL
JOURNAL OF THE SOUTHERN MEDICAL ASSOCIATION
PUBLISHED MONTHLY AT BIRMINGHAM, ALABAMA

Volume XI AUGUST 1918 Number 8

TROPICAL DISEASES AND PUBLIC HEALTH

THE IMPORTANCE OF MALARIA FROM A PUBLIC HEALTH AND ECONOMIC STANDPOINT*

By W. S. Leathers, M.D.,
University, Miss.

Malaria is the most prevalent disease in all semi-tropical and tropical countries. It is the most frequent cause of sickness and death in those parts of the world that are most densely populated. It is also the most prevalent disease in the United States, and at least two-thirds of the cases found in this country occur in the Southern states.

Malaria is one of the greatest scourges inflicted upon humanity. It is a menace to any people or country in which it has a decided incidence. In the number of deaths caused either directly or indirectly, the sickness and suffering, the loss of time and efficiency, the expense, the lowered vitality of those afflicted and in the reduction of the valuation of property, malaria is without a rival among the diseases afflicting mankind.

A careful investigation shows that about 15,000 people die directly from malaria each year in the United States. In one Southern state, and this is not an exception, the statistical data obtained on the mortality of malaria shows 1,492 deaths in 1915. This does not take into consideration the indirect effects of the disease and the consequent mortality assigned to other causes, which in reality malaria is responsible for in large measure. It is, therefore, a disease which either directly or indirectly causes thousands upon thousands of deaths. From this point of view alone it is of the greatest importance as a public health and economic problem.

In addition to the mortality accruing from malaria there are from 1,500,000 to 3,000,000 people in the United States sick from this disease annually. This sickness and suffering is confined largely to the Southern states. It means that this disease not only produces acute illness, but because of neglect and ignorance, thousands of these people develop chronic conditions which are either incurable or only partly relieved by treatment.

Malaria is a disease of grave consequence not only because of the misery which it inflicts upon mankind, but because of the serious opposition which it has opposed to the march of civilization. It strikes down not only the indigenous population, but with still greater certainty the pioneers of civilization—the planter, the trader, the missionary, and the soldier. Indeed, no disease has proven more inimical to the advance of civilization than has malaria.

But the loss of time and efficiency are the principal effects of malaria. This applies especially to the industries and farming class of our country. It is largely a rural disease, and for this reason the greater part of this loss falls upon the farming class.

A most valuable and accurate investigation relative to the loss of time and efficiency from malaria has been carried on by the United States Department of Agriculture under the direction of Mr. D. L. Vane Dine. This work was done upon a plantation in Louisiana. In the course of the investigation it was deter-

*Read before Conference on Malaria (National Malaria Committee), Southern Medical Association, Eleventh Annual Meeting, Memphis, Tenn., Nov. 12-15, 1917.

mined that the greatest losses from malaria, on a plantation, are sustained from the loss in time and the reduced efficiency of the labor at the season of the year when the labor is most needed to cultivate and to harvest the crop.

The figures which Mr. Van Dine presents were based upon the conditions that obtained during the season of 1914. The survey work included a detailed study of 74 tenant families on a plantation and an investigation of the amount of malaria among them in a region where the plantation operations and endemic malaria are typical. The plantation cultivated 1,800 acres of land, 1,191 acres by the tenant system and 609 acres under the direct supervision of the plantation management by labor drawn from the tenant families on the day-wage basis. The tenants averaged 16 acres per family. The 74 families show a total of 299 individuals, or an average of 4 persons per family.

The crops grown on the plantation were cotton, corn, oats, cowpeas and lespedeza.

Reducing all the available labor on the plantation to adult time, there was an equivalent of two adults to each of the 74 tenant families. The actual time lost through malaria among these families on this basis consisted of 970 days for those treated by the plantation physician, 487 days for those cases not reported to the physician, and 385 days lost by non-malarial members of the families in attending those who had the disease. There was a total loss of 1,842 days. This reduced to adult time, not taking account of illness in members of families under 8 years of age, amounts to 1,066 days of adult time from May to October, inclusive. The time lost averaged 14.4 days for each family. There were 166 cases of malaria in 138 persons out of the total of 299 members of the tenant families.

There was a loss of time equivalent to 6.42 adult days, or roughly 6 days for each case of malaria. It was shown that the time lost from malaria, during at least four months of the year, falls at periods when there is a deficiency of labor and when the demands of the crops for labor are greatest.

Howard estimates that one-fourth of the productive capacity of an individual suffering with an average case of malaria is lost. One hundred and thirty-eight persons out of a total of 299 among the tenant families on the plantation, suffered from malaria during the crop season. Not taking account of the cases in children under 8 years of age, and the time lost by adults who were not suffering from malaria attending those who were sick, the equivalent of the time of the malarial people is equal to the time of 74 adults. A reduction of 25 % in the efficiency of 74 adults equals a total loss of time of 18.5 adults. An average of two adults per family would indicate a loss equivalent to the total time of 9.25 families, or roughly 9 families. This means that the work of the 74 families was equivalent to 64 families because of loss of efficiency due to malaria. This is on the basis that every man, woman, and child worked every available day.

It was also found that the actual time lost was equal to 5.54 families, and this, added to the effect of malaria on efficiency of the labor upon this plantation, amounting to the time of 9.25 families, would give a total loss of the time of 13.79 families. This means that with malaria controlled this plantation could operate with 60 tenant families where 74 families were employed.

From a purely financial standpoint it was found that $2,200 was lost through sickness and $4,300 through inefficiency from malaria on this plantation, a total loss of $6,500. This is an accurate investigation of the actual loss of time, efficiency, and money loss on one plantation from this menacing disease. It is not possible to place a value on human life, but when considered from a purely economical standpoint it is estimated that malaria costs the United States one hundred million dollars annually.

We will now consider briefly what one million five hundred thousand cases of chills and fever, the minimum number, in one year means. In other words, what does this mean to us in dollars and cents? Assuming that medical attendance, drugs, and nurses' bills, including the loss of time of members of the family caring for those who are sick, will entail on an average an expenditure of $5.00 for each case of chills and fever, which is certainly within the bounds of conservatism, this would

amount to the expense of $7,500,000 in one year. But this is but a small item of the total cost of malaria to a county, state, or country.

Then we must not overlook the fact that malaria is a disease which pre-eminently lowers the vitality of those who suffer from it. It therefore weakens the body and opens the way for other and more serious maladies. Upon careful investigation it would doubtless be found that there is often a very close relationship existing between the presence of malaria and the occurrence of tuberculosis, typhoid fever, and a group of what may be termed the more fatal diseases. In other words, the incidence of malaria has without question increased the incidence of tuberculosis and typhoid because of the devitalizing effect of chills and fever upon the body and often the chronic course upon the body. It is not possible to place even an approximate estimate on the effects of malaria in lowered vitality; but it is well known that a normal degree of vital resistance is fundamental in the prevention of disease. Any condition of the body which lowers the vitality and resistance exerts a tremendous effect upon the health standard of a people.

From a purely economic standpoint where the incidence of malaria is high, land valuations are proportionately reduced. For example, the Delta of the Mississippi River is conceded to be the richest farm land in the world, still much of this valuable land today is being bought for from $20 to $40 per acre. Thousands of acres of this section of our country remain uncultivated, or but poorly cultivated. Why is this territory with such wonderful agricultural possibilities not thickly populated? Why is it not being sold for from $200 to $400 per acre? If it will produce from one to two bales of cotton to the acre, and it does, then it is worth the above price. A bale of cotton costs, under average conditions, from $15 to $20 for production, and this return can be maintained for years without the addition of a pound of fertilizer. Under average conditions if this land will produce a net profit of from $30 to $90 per acre, it is a splendid investment at $100 to $300 per acre, yet much of this land does not sell on the market for anything like that amount. Moreover, it is not being populated, chiefly because of the high incidence of chills and fever.

To summarize, a disease which causes either directly or indirectly such loss of human life, sickness and suffering, loss of time and efficiency, expense, lowered vitality, with reduction in the valuation of our most valuable lands, deserves aggressive and intelligent consideration on the part of public health officials, physicians, and laity. So long as malaria continues to be prevalent, it means a listless activity in the world's work that counts mightily against the wealth-producing power of the people.

When it is realized that malaria is a preventable disease and that the necessary information for its control and ultimate eradication is more nearly in hand than that of most infectious diseases, it is nothing less than criminal for a progressive civilization to remain idle in the face of such convincing facts.

DISCUSSION

Dr. H. R. Carter, United States Public Health Service, Baltimore, Md.—If Dr. Leathers had attended the St. John's Baptist Church yesterday, I would have thought he had taken the title of his paper from what I said on that occasion. But he was not there. I preached in that church yesterday morning on the importance of malaria in the United States, and in his paper he has taken almost the same views that I enunciated in my sermon.

There are only two or three points I have jotted down to speak of briefly. Dr. Leathers mentioned the social injury that malaria produces. It inflicts a great social injury in that it obliterates the white race absolutely. You will find no place where malaria is really prevalent in which the white race is not replaced by the other races if they have access to it. That is true of no other disease. I know of no place that is thriving where malaria is prevalent. Places in which malaria is prevalent do not thrive. In a section of the country south of Memphis, where yellow fever prevailed seriously, New Orleans was a thriving, prosperous city. The same was true of Havana, Cuba. But where malaria prevails the white race can not thrive. It is not only a sociologic evil, but a racial one.

Tuberculosis works in another way. Tuberculosis is much harder upon the black than upon the white race, possibly due to the mode of living or to racial susceptibility to the disease. Dr. McBrayer told me yesterday that they had received an appropriation of $125,000.00 for their tuberculosis sanitorium in North Carolina. Eastern North Carolina is a very malarial country. The State of North Carolina has not so far spent a single cent toward the eradication or control of malaria, yet it has appropriated $125,000.00

for the control of tuberculosis. I do not say that is not right, but I think the State should appropriate some money toward such a serious economic disease as malaria. I venture to say that a dollar spent in the control of malaria will bring in greater returns than $2.50 or $5.00 spent in the control of any other disease. I know it, and I think Dr. Bass and Dr. Derivaux can give us some statistics to show that I am right.

Dr. Oscar Dowling, Shreveport, La.—I think what Dr. Leathers said prevails throughout the entire section of the South, namely, that it is difficult to get doctors to report all cases of malaria. A great many of them make these reports, but they do not confirm their diagnosis by the use of the microscope, and when we succeed in getting definite reports from the various committees, men will immediately throw up their hands and say there are not that many cases.

Dr. Frederick J. Waas, Jacksonville, Fla.—There is one point in this paper that I want to discuss for a moment and bring out, if possible, a little more forcibly than Dr. Leathers did, namely, the number of cases of malaria reported. The Doctor, from his conclusions, decided that the report he had of us (there were 150,000 cases of malaria in our State) was correct. I want to differ with him a little bit on that point by saying that I believe it would not represent more than three-quarters of that much of the percentage of cases we really have. I make that statement from the fact that in serving as County Health Officer for the past three years and traveling over the cities of the County and studying the morbidity reports in the various counties, I am convinced that they do not report so many cases as have occurred in the County by half because of the fact that so many people go to drug stores and buy quinin and chill tonics and treat themselves. Among the white race especially is this true, more so than among the Negroes As County Health Officer in watching and studying the reports of doctors and studying the number of cases in our community, I am sure that not more than half the cases of malaria that have really occurred in that community and County have ever reached me in the form of a morbidity report. I would not like to say that it is the practice of all doctors not to report their cases, but it is the practice of many of them. I feel that I should give the figures just as they are, and I know Dr. Leathers has not intentionally misrepresented our State. In fact, he was rather too charitable, but if there is anything wrong we have 250,000 cases instead of 150,000. Of that I am sure.

Dr. C. C. Bass, New Orleans, La.—In connection with the economic importance of malaria, I had occasion a few days ago before an audience consisting largely of the Board of Supervisors and influential planters of a certain Delta county to make an estimate of what they were probably paying year after year on account of malaria in their county. It happened to be a rather large county, and the number of cases reported to the Board of Health was something over 10,000 for each year during the past several years. These were cases of malaria that were treated by doctors. I have inquired of some doctors in the Delta what would be a reasonable estimate as to the approximate cost or charge per call in malaria cases in the Delta. There was more than an average of one call of some kind in each case that called in a doctor and was reported by the physicians of the county. The average charge would be more than $5.00, and that means more than $50,000 for doctors' bills alone.

These were cases of malaria sick enough to call a doctor. There is a much larger number of persons who have attacks of chills and fever and other forms of malaria who do not call a doctor at all. Many of these treat themselves with patent medicines, chill tonics, quinin, etc. Many thousands of dollars are spent in this County each year for this purpose. It is reasonable to presume that the money spent in the County yearly for remedies for malaria other than doctors' bills is more than $25,000.

Loss of time is also very great. If we assume that for every person who has malaria and calls a physician, there are at least two others who do not call a physician and, therefore, would not be included in the 10,000 cases reported to the Board of Health, there would be a total of at least 30,000 attacks of malaria in the County during a year. This is a very conservative assumption. If we assume, further, that an average loss of as much as five days of time results in each case, the total loss is 150,000 days.

Loss from reduced efficiency in the large number of persons who have attacks of malaria and also those who are infected but do not develop recognized clinical symptoms of the disease, must be very great. We have no way exactly of estimating this in figures.

Loss of life on account of malaria as a direct cause of death and also as an indirect cause by lowering the general vitality, is considerable each year.

Finally, one of the greatest losses of all is the reduction of property values, especially land values. I believe that if any Delta county could entirely eradicate malaria from the county so as to be able truthfully to say to the world that there is no malaria there and thus it is one of the most healthful sections in the United States (which it would be), the value of land would be doubled in a very short time.

If all these items could be reduced to dollars and cents, it is very apparent that the annual loss in this County alone would be seen to be simply enormous. Many other sections would show an equally high loss.

Dr. Leathers (closing).—It seems to me almost an unbelievable thing that we people should have lived in these Southern sections with so much actual waste from a disease such as malaria and have been so slow in awakening to the conditions that exist in the Southern states. We know very well that whenever we create great enthusiasm in a fight against malaria and mention some statistical matter, such as I referred to in my paper, commercial organizations throw up their hands and say, "We have very little malaria in our section." We hear that statement in the Delta of the Mississippi River, and we know that malaria is quite prevalent.

We have a big problem before us to counteract that immense influence. It is a commercial in-

fluence to a considerable extent. We have indifference and lethargy and ignorance which is appalling relative to the malaria situation, and without any question it becomes a public health problem in my judgment.

While I referred to the fact that 153,000 cases of malaria are reported in Mississippi, the expenditure mentioned represented approximately a public health problem. From the statements which have been made here this morning, I simply indicated how much malaria existed in Mississippi.

In referring to Mississippi I emphasized the point that all of us are affected with this disease in the same way, that is, no one state has any corner on this particular problem. So I believe henceforth all of us should honestly and vigorously fight malaria.

MODERN ASPECTS OF MALARIA PROBLEMS IN PEACE AND WAR*

BY FREDERICK L. HOFFMAN,
Third Vice-President and Statistician, The Prudential Insurance Co.,
Newark, N. J.

The title of this address is as broad as the subject itself. There are so many aspects to the malaria problem that one can only hope to be able adequately to treat of certain phases thereof within the short time limited for the discussion. There is nothing more gratifying to those of us who have been directly responsible for the bringing into existence of this National Committee on Malaria than to have present so large an audience of men actively and vitally interested in the subject. It is often not the papers that are read but the full expression of individual viewpoints which brings forth ideas of real and lasting value. It is only to the extent of a thoroughly-aroused individual interest that the problems that concern us can be brought measurably nearer to a successful conclusion.

The statement has been made by Dr. Leathers, the State Health Officer of Mississippi, that during the year 1916 the number of reported malaria cases for that State was not far from 160,000, — equivalent to a rate of about 8 %. The most conservative previous estimate for Mississippi was only about 5 %, and for the entire South about 4 %. Yet even Dr. Leathers concedes that in his State, which has the most admirable and successful system of reporting, a considerable number of cases are not returned. Nothing would be more desirable than that the example of the State of Mississippi should be followed by all of the other Southern states at least, and California, so that a correct index of malaria morbidity could be secured for at least all of the endemic areas of the country more or less seriously affected by the disease at the present time. Until that is done, the data for the State of Mississippi must not be used for comparative purposes, since erroneous conclusions would be unavoidable. In other words, states making inadequate returns would apparently be less subject to malaria than is actually the case, whereas the State of Mississippi, which, as a whole, can not be considered exceptionally subject to the disease, would be presented in a rather unfavorable light.

A case of malaria is a rather indefinite something which the best authorities have not been able to define for precise statistical purposes. It may be the mildest form of parasitical infection, quite unknown or unobserved by the person affected. It may be a latent case or one that is quite harmless or one of the most pernicious varieties. There are so many mild cases in the rural sections that fail to exhibit suggestive or alarming symptoms that it will probably always be a difficult matter to secure entirely accurate and complete returns of malaria cases by whatever system or method of reporting may be adopted.

As to what should be reported and what not depends, therefore, primarily upon the definition of a reportable case. A positive blood-index is, of course, entirely conclusive, but a negative index is not necessarily evidence of the absence of infection. Nevertheless, the blood-index of a population is an essential pre-requisite for the correct ascertainment of the frequent occurrence of the disease in particular localities. The fact that the absence of the malaria plasmodium in the peripheral circulation fails occasionally to disclose the presence of the disease is not sufficient seriously to disturb the accuracy of the con-

*Read in Conference on Malaria (National Malaria Committee), Southern Medical Association, Eleventh Annual Meeting, Memphis, Tenn., Nov. 12-15, 1917.

clusions arrived at. Even on the Isthmus of Panama, where they are probably more familiar with the diagnosis of malaria than anywhere else in the world, about one-third of all the deaths could not be diagnosed otherwise than clinically.

For the information of this Conference I have brought together the latest malaria mortality data for seventeen of our principal Southern cities. There could not possibly be more gratifying evidence, for commercial as well as for medical and humane reasons, than the statement that never in the history of the recorded mortality of the Southern states has the malaria in a fatal form been so rare as at the present time. All of the cities show a very marked decline in the fatal form of malaria, both in the white and the colored races. The Negro, however, is shown to be from three to four times more liable to the fatal form of malaria than the white race.

For the city of Memphis the malaria death rate during 1916 was the lowest on record. In less than ten years the mortality from malaria in Memphis has decreased 63 %. In former years the rate was as high as 65 per 100,000, whereas at the present time it is only 24. These rates, however, are for the white population only. For the colored population the equivalent decrease in the rate during the same period of time was 73 %. Of course the question remains debatable as to whether the decrease in the death rate is actual or only apparent; but we know, as a matter of certainty, that there has been a general decline in the death rate from all causes so that improvements in diagnosis or the transfer of deaths from one classification to another can not possibly account for the larger portion of the decrease, which, as a matter of fact, has taken place.

The capital of Tennessee, Nashville, in former years also had a heavy death rate from malaria. During ten years, however, the malaria death rate has decreased from 22 per 100,000 to only 1. As a matter of fact, in the entire white population of Nashville during last year there was only one death reported from malaria; and in the colored population there were only two.

What Dr. Andrews, the health officer, said in his address of welcome about the situation in Memphis at the present time and about what has been done by authorities of international reputation to study the situation in this section and of replacing guesswork opinion and apathy and indifference by a thorough knowledge of the facts, is in every way the most encouraging statement which has been forthcoming in recent times. After all, it is first a question of the impartial ascertainment of the truth and the courageous application of the lessons learned by scientific investigations, especially of a problem so extremely involved as malaria in its variety of forms. There is in this respect no more interesting sanitary experience than that of Memphis, unless possibly that of New Orleans. There are no more instructive documents in the study of public health problems than the early reports and discussions in the *Journal of the Memphis Medical Society* of the '50s, the '60s, the '70s and the '80s. During these forty years the main effort seems to have been to delude and deceive not only the public but the medical profession as well by platitudes and guesswork opinion, an appeal to Providence and by what-not else. The scientific study of the situation was practically hopeless. But that era has passed forever, for even 'though there are still ignorant and indifferent boards of trade or chambers of commerce or real estate agents who believe they can help the community by disregarding the truth, the number of these is gradually being reduced to negligible proportions.

Now, for illustration, there are the Delta counties of Mississippi, where, by courageously facing the problem of malaria eradication, real progress has been made during recent years. Broadly speaking, there has been no attempt to disguise the facts of malaria occurrence and of the seriousness of its excessive local incidence in certain localities. By co-operating with the International Health Board, Bolivar County, for example, has initiated a well-considered plan for quinine immunization. Whether that effort will prove entirely successful is for the time being an open question, but the evidence thus far available seems to prove quite conclusively that the percentage of parasitical infections is be-

ing materially reduced. That, of course, may not be equivalent to a permanent reduction in malaria frequency, but at least the effort is worth while and evidence of a clear realization on the part of the community that the problem must be solved by the best means experience may suggest. It is to be hoped that in course of time the statistical data will be subjected to a thoroughly critical and qualified analysis and that a thoroughly descriptive account of the scientific methods and practical results of the plan will be made public.

In Arkansas the International Health Board, in co-operation with the U. S. Public Health Service, has initiated malaria eradication plans along very different lines. What has been done in Ashley County, particularly, is deserving of the notice of all who desire to secure results at the least expense. At Crossett and Hamburg reliance is placed exclusively upon drainage, screening, etc. Mosquitoes have largely been exterminated and a very considerable reduction in the incidence of malaria has followed within a comparatively short period of time. For interesting details of what has thus far been achieved, reference should be had to the annual report of the International Health Board of the Rockefeller Foundation. These evidences of progress are most gratifying to those who have actively furthered the plans and purposes of the National Malaria Committee. There never was a time when the duty of malaria eradication was so paramount upon each and every locality as it is today. On account of the War vast bodies of Northern troops have been placed in Southern cantonments with the practical certainty of extensive exposure to the risk of malaria infection. The risk of reintroducing the disease into Northern communities and subsequently among the troops on the Western front is clearly recognized by the authorities. It is, therefore, of the utmost importance that effective control measures should be applied to the extra-cantonment areas in the Southern states where malaria is known to prevail. While much has been done in this respect, it may well be suggested on this occasion that the states on their own part should initiate control measures in active co-operation with the Federal authorities. With commendable foresight the Australian Government has employed entomologists to survey areas in the irrigation districts which have been set aside for the settlement of returning Australian soldiers from the War zone. It has been found that the anopheles mosquito is quite common in these areas, and it is therefore a foregone conclusion that soldiers infected with the malaria parasite would introduce the disease into areas of Australia which are now entirely free therefrom. A regulation has therefore been adopted that a blood examination will be required of every soldier assigned to one of these settlements and that he will not be permitted to proceed to a future place of residence until entirely free from the malaria plasmodium. A similar measure is urgently called for on the part of this country if sections in which the anopheles mosquitoes are relatively common are not to become new centres of malarial infection and disease dissemination.

Malaria in the Army is now of much greater importance than typhoid fever. While a gratifying reduction in the frequency of malaria has been achieved at many Army posts, the disease continues to be a serious menace to Army efficiency. It should not be much more difficult to eradicate or control malaria in the Army than typhoid fever. It would serve no purpose to enlarge upon this question, but it is self-evident that unless the Army authorities have the most thorough-going co-operation on the part of local boards of health and state health authorities, the required further reduction in the frequency of the disease can not be achieved.

What we need in this country is a better scientific presentation of the facts of malaria occurrence in particular localities and given areas in which the incidence of the disease is considerably above the average. We have no descriptive accounts corresponding to the admirable reports which have been made for certain areas in Burma, Ceylon, the Straits Settlements, etc. For India, particularly, a large number of excellent accounts are available, which should guide local efforts in the adequate, intelligent and strictly scientific presentation of the facts. Nor have we in this country made determined efforts at malaria education. More is apparently being done in this respect for the native

population of Burma and the Philippine Islands than for the people of any section of this country. Posters illustrating the essential facts of the mosquito transmission of the disease, of the remedial value of quinin, of the preventive value of screening, drainage, etc., should be made use of at least in every locality in which malaria is of more than normal frequency. Such posters have been made effective use of in connection with tuberculosis, and there are the most convincing reasons for believing that the results of such an educational campaign would be even more far-reaching in the case of malaria.

Equally unsatisfactory is the statistical ascertainment of the true incidence of malaria throughout the Southern states and California. What is being done in this respect by the United States Public Health Service requires a considerable amount of improvement before the results can be considered entirely conclusive and of much practical value. The reports which are being published depend upon the voluntary co-operation of practicing physicians, who, unfortunately, are only too often derelict in their duties. Those who are unwilling to render this small amount of active co-operation fail conspicuously in their duty both toward their profession and the public. Every doctor throughout the South should be required to report cases of malaria in precisely the same manner as cases of acute infectious diseases or tuberculosis, poliomyelitis, etc., are reported. The remarkable achievement on the part of the State of Mississippi to secure such reports from practically 100 % of all the physicians is a notable illustration of what can be done by patience and skilful administration. The example of Mississippi should be followed by every other Southern state desirous of being placed in the front rank of thoroughly civilized communities. The existing apathy and indifference in this respect is lamentable evidence of a backward condition the menace of which is but very imperfectly realized by the public. The state and local health officers indifferent to their duty in this respect should be replaced by competent men willing and able effectively to serve the real interests of the public. In exact proportion as we improve our methods of reporting infectious or transmissible diseases, including malaria, we shall lay the foundation for more successful eradication measures than have heretofore been adopted and found useful in actual practice. In proportion as we improve the co-operation on the part of the communities, the state, the Federal Government and large business corporations, foundations, etc., as urged and suggested in my "Plea and Plan for the Eradication of Malaria Throughout the Western Hemisphere," shall we lay the foundation for the higher attainment of health and efficiency on the part of the people of the communities who now suffer physically, socially, economically and otherwise because of the unchecked ravages of malarial disease, regardless of the fact that malaria control is feasible and practicable at reasonable expense.*

DISCUSSION

Dr. W. S. Leathers, University, Miss.—I wish to emphasize particularly one statement which Mr. Hoffman made at the conclusion of his paper, and that is the relation which the medical profession should sustain to the health authorities in reporting morbidity and mortality statistics. I think he is eminently correct in saying that it is the duty of a doctor to give this information in behalf of humanity, and we can not study the question of public health in a scientific way unless we get this information; and yet it is not infrequently the case a doctor says he is too busy. That is a common statement for him to make in connection with these statistical data.

Mr. Hoffman has referred to the data which has been obtained in Mississippi. I want to indicate that it is my judgment the data we are obtaining in Mississippi is not being obtained as we ought to get it, for the reason that it would be better to obtain that information from reports of cases, and to get certain statistical data about each patient would require much time. We are simply getting reports of the number of cases each month which are very helpful, but upon a more perfect basis we ought to get more data than that, and I believe that the Federal Department of Health will in time have to come to our assistance along that line, and if possible give us the franking system of getting this information from the various physicians all over the country. I think the Federal Government owes that to the people of the country, and if that was asked from the Federal Department of Health it would relieve us of expense and make it uniform and would make this data much more valuable in the hands of health officials in the prevention and control of disease.

*For a more extended discussion see my "The Malaria Problem in Peace and War." For copies apply to the Prudential Insurance Co., Newark, N. J.

Mr. Hoffman referred to one feature that I want to speak about, and that is the posting of placards and educational work. That, of course, is very important, and I believe we can make rapid strides by any kind of efficient educational work, but I am firmly convinced in order to get definite and permanent results in doing educational work, we must introduce with it some kind of demonstration methods. I think we ought in some way to get in a community tangible activity and show definite results in connection with the educational work. I believe we can preach the gospel of eradicating malaria cheerfully, and thousands of people will never be awakened by preaching that gospel. We have to demonstrate to them. We have to show them the benefit of public health by getting rid of disease in a certain area, and then the educational placards and various educational methods which are being used will be most effective in the work which is being done.

Dr. John W. Kerr, United States Public Health Service, Washington, D. C.—Mr. Hoffman is able, more than the average man, by reason of his statistical studies, to see malaria from different standpoints throughout the world.

In listening to his remarks I have been impressed with the active interest that has been manifested in malaria by countries other than ours. Having served abroad for a number of years and in the tropics, I have been impressed with the attention malaria has received in those areas; due, of course, to the fact that in large measure public health work in the tropics is primarily the problem of facing malaria. The building of the Panama Canal was essentially the control of malaria and all of the other health activities were subsidiary.

Again, in the tropics the forms of malaria are oftentimes extremely severe, whereas with us fortunately malaria is more or less mild. The fatalities are very few in proportion to the large number of cases. Just last week I was riding on the train, and sitting in the smoker was a half-grown boy who was having violent chills from malaria. I mention this to show that the disease is comparatively mild in this country. In consequence its control does not exact the attention it deserves.

Another reason for the unusual attention given to this disease in the tropics is the fact that health organizations in many tropical countries are concomitants of British Government. When we speak of health organization and health work in the Orient, outside of Japan and the Philippines, we mean the British Government. It has gone there, and necessarily so, with competent health officials, men who have degrees as Doctors of Public Health, and the good work in malaria in those countries is due to these gentlemen, based upon the original researches of Ross and his coworkers. They are not sent out there until some provision is made to finance the operations which they are expected to carry on; and while they are limited in the amount of money available for this purpose, they do have some money for the fighting of malaria. They did it in a number of ways in the particular colony I was in, and the means that we are using and advocating today were being carried on there sixteen or eighteen years ago. Malaria in that section was so severe in certain areas that depopulation was one of the methods to combat it. It was not expected that a white man would live unprotected outside of certain areas in that colony. I was very glad to hear the suggestions of Mr. Hoffman in respect to the fact that other problems have confronted us in greater degree than malaria. I want to impress upon the Conference, however, that publicity alone will not meet the situation. Since the Public Health Service has taken up this problem, our purpose has been to provide, in the continental United States, demonstrations of malaria control on a smaller scale, but fully as convincing as any that have been carried on outside of the United States. I think definite progress is being made in this respect. We are too prone to consider that publicity is practically all of health work, and to forget that its more important aspect from a sanitary administration standpoint is the enforcement of ordinances. Public health organizations should have the aid of all civic organizations in carrying out health ordinances. After requiring such measures the people should observe them and depend upon their organized health departments. The greatest need in this country today for the combatting of malaria is properly organized and supported health organizations. Fortunately in the last decade great progress has been made in the South in this respect, and one of the best signs of the times is to see on duty here and there full-time health officers. This feature is growing in greater degree in the South in proportion to population and wealth than in the North.

Dr. H. R. Carter, United States Public Health Service, Baltimore, Md.—There are one or two things in connection with Mr. Hoffman's remarks I would like to speak about. In the first place, I think his figures as to the prevalence and the cost of reduction of malaria, drawn mainly from cities, must be taken *cum grano salis*. Malaria is not a civic disease. I don't mean to say that it does not occur in cities, because it does. As yellow fever occurs in the country, so malaria occurs in the city. I am inclined to think that the decrease of malaria districts in cities is not a measure of decrease in malaria in the country at large. I think it is mainly due to better diagnosis.

Hematological diagnosis is generally made in cities far more frequently than it is in the country. Therefore, malaria diagnosis is excluded in the cities. I doubt whether you can draw any deduction as to the prevalence of malaria in the United States, or any proportional deduction I had better say, from its diminution or increase in cities.

The next point I wish to refer to is with reference to education. I have had far better success by concentrating attention on two points: first, by educating the child. Teach him the facts about malaria and the control of it. He will get those facts down and believe in them absolutely and entirely. Teach him the facts about malaria by means of a leaflet as Arkansas does; or, as Virginia and North Carolina have done; teach malaria in the schools of the South as they do geography and mental arithmetic. I am inclined to think that is of as much or more value pos-

sibly than very many lectures, illustrated with slides, or with popular posters put about on stations. Malaria will stay with us for some years, and the generation now in the primary schools will have need of this information when they become men.

The next thing is to educate the adult. I judge there are a great many states represented at this Conference, but who is there present who would not rather be shown than be told? People like to see demonstrations. You may tell people certain facts about malaria, but if you make a malaria demonstration, pointing out the places where malaria prevails badly, and take the worst places you can get, and do not do a great deal of talking about it, but clean malaria out of that community, you will have an object lesson that will appeal to the "man from Missouri."

One other point: reports come next. The United States may do what it can to get these reports. It does not do so much as it ought to do; but it has no authority whatever to make people report. All it can do is to ask them and persuade them to report. If men will not make these reports, the United States is powerless. The states legally have authority to make them report.

As to the comparison between ourselves and abroad, I was in Trinidad last November about this time and stayed there some little while. If the health officer said the truth, they may have an elaborate service; but their control measures have been nugatory. Americans work on a different plan possibly from the English people. I remember very well in April, 1904, when Christophers and Major James were sent to Miam Mir to make a survey of that district and to protect the cantonments from malaria. Both of them were able men. Both of them were good entomologists. Either one knew more about malaria than everybody on the Isthmus together. They published two reports, which were beautiful reports. They gave the blood-index of the soldiers. They gave valuable data on the flight of the different species of anopheles. But at the end of the time their conclusion was that no measures for the diminution of anopheles would have any effect in lessening malaria! Malaria had actually increased in the camp, I don't say as a result, but in spite, of their efforts for two years to control it.

We went to Panama in May of the same year, and as I said none of us really knew much about malaria. The first blood-index we took was 78 % positive. We did not publish it. The first thing published was Darling's "Notes on Malaria" in 1910. In 1907, although we had published nothing and made no reports of special value, *we had absolutely controlled malaria,* bringing it down from what it was to *less than one per cent.* in the Isthmus. I can not but think that the work we did there was more valuable than the work done by the very scientific and learned men I have mentioned.

The work at Trinidad was simply a survey and not the control of malaria, and unless a survey leads to control I count it valueless. Information that does not lead to remedy is of small account.

Mr. Hoffman (*closing*).—There is not much more for me to say except that I regret that there should not have been more discussion on matters of detail. You gentlemen owe it to the Nation as a duty to bring forward your own ideas, for it is only by utilizing the actual experience which you have had that you can render substantial help to the National Committee on Malaria Eradication. Every individual experience is of value, but most of all the knowledge gained in rural communities for which the general facts are not a matter of public record. By bringing forward a brief statement of what has been done in certain foreign countries, I trust that I was not understood as giving an unqualified endorsement of all that has been attempted or been done by way of preliminary or experimental eradication measures, although, in the main, I feel satisfied that the results of local measures have been satisfactory.

I referred in some detail to the Trinidad investigation regarding which an admirable report has been made public. I quote from this report the statement that "These results, when compared with the two censuses in other colonies, give us reason to expect that preventive methods against malaria in Trinidad will be attended by gratifying results." The spleen censuses of 1913 and 1914 indicate a reduction in the malaria-index as thus determined from 18 to 14 %. That, of course, is not sufficient, but it is nevertheless evidence of real progress, considering the class of population dealt with, which consists chiefly of Negroes and East Indian coolies.

With reference to what Dr. Kerr has said regarding the low rate of malaria incidence throughout the country as a whole, it requires to be kept in mind that the rate of frequency varies widely, and, for illustration, in Dunklin County, Missouri, the mortality is as high as 297 per 100,000, which compares with 252 for the colony of Sierra Leone on the west coast of Africa. There are other sections of this country which are as badly afflicted as almost any portion of Africa. I have personally visited the heavily-infected counties of southeastern Missouri, and while enormous progress has been made, the results are almost entirely attributable to major drainage operations undertaken for economic reasons and not because of well-considered malaria eradication measures.

Dr. Carter seems to think that the decline in the malaria death rate of our Southern cities can not be relied upon as evidence that corresponding progress has been made in the rural sections. I do not share the view that the decline is largely in consequence of improved methods of diagnosis. I have interviewed a large number of Southern physicians and while unquestionably microscopic diagnoses are more common now than in former years, the use of the microscope has rather facilitated the accurate differentiation of the several types of the disease than rendered substantial aid in the elimination or the addition of diseases heretofore erroneously diagnosed. It must be kept in mind that there has been a very substantial general reduction in the mortality from all causes throughout the South and a relatively large share of this reduction is unquestionably because of the gradual elimination of

malaria. Hence, I feel satisfied that the statement can not be made too strong that the reduction in the malaria death rate is not attributable in a marked measure to improved diagnosis. Furthermore, the reduction in many cities, such as New Orleans and Jacksonville, has been so pronounced and been so obviously connected with local eradication measures, that the theory of improved diagnosis can not possibly be sustained by an appeal to the facts.

It is unquestionably true that the reduction in the malaria mortality has been largely in the cities. The health improvement of Southern communities generally has not been what it should be. In Georgia, for illustration, the State health administration has heretofore been thoroughly ineffective. Georgia has not provided for the registration of vital statistics and the required facts are therefore not a matter of record. Georgia might well follow the admirable example of the State of Mississippi and provide for both the registration of deaths and notifiable diseases. Much the same conclusions apply to Alabama, Louisiana and Texas, than which there are no more important Southern states regarding the intelligent study of disease prevalence, particularly with reference to malaria. It is almost unbelievable that there should still be at the present time states unwilling to concede the practical importance of vital statistics by adequate provision for their complete collection, tabulation and analysis under qualified control. A suggestion may here be made that there should be a sharing of Federal, state and local responsibility for the most efficient health administration, if necessary, on the basis of a proportionate distribution of expense. The problem of health in the rural South, in many sections, at least, is appalling, when all the difficulties, financial and otherwise, are taken into account. I firmly believe that sooner or later we shall have a reorganized Federal Health Administration which will have a share in the local administration on the basis of a Federal appropriation of, say, one-third the cost, plus one-third to be paid by the state and one-third by the community as such. After all, the health of no community is purely a community problem, but is in every sense also a local and a state problem. If a resident of a healthy community visits a neglected community and contracts malaria or typhoid, it is surely the duty of the state and the Federal Government to see to it that the required improvements are brought about in the most efficient manner and with the least waste of time and effort. As long as the health of locality is nobody's business and as long as the position of health officer in rural communities is held by a doctor or a politician without pay, it is a foregone conclusion that the health conditions will not be what they ought to be. Whenever we shall have a thoroughly effective rural health organization in the South, the malaria problem will solve itself.

MALARIA CONTROL IN THE ENVIRONMENT OF THE CANTONMENTS*

BY J. A. LEPRINCE,
Sanitary Engineer, United States Public Health Service,
Washington, D. C.

In 1898, when our troops were assembled at camps in the Southern states, we knew practically nothing regarding malaria control. As a result, large numbers of our troops contracted malaria before leaving for Cuba, and on the day of the battle at Santiago many of our soldiers were unfit for duty.

Since that time we have learned and applied economical methods of malaria control first in Cuba and then in Panama. In 1913, Dr. H. R. Carter, Assistant Surgeon-General, U. S. P. H. S., began malaria surveys in North Carolina and Virginia, and then directed control measures in North Carolina. From 1914 to 1917, malaria control measures have been applied in ten of the Southern states with decidedly satisfactory results and much new information has been acquired that has a practical bearing on the economic control of malaria in this country.

It has been determined beyond a doubt that it is more economical for a community to control malaria than to continue to suffer from its ravages. Also that the best methods of control for any community will often depend upon topographical conditions and density of population.

Soon after the declaration of war with Germany it was decided to establish military cantonments and aviation fields in the Southern states. Most of them were located within a short distance of cities or villages, and in some instances there was a considerable rural population in, or not far from, the cantonment sites selected.

With the exception of in the State of Mississippi, unfortunately very little useful data was available concerning the presence or amount of malaria in and near the proposed military camps, a condition which can and should be remedied by the

*Read before Conference on Malaria (National Malaria Committee), Southern Medical Association, Eleventh Annual Meeting, Memphis, Tenn., Nov. 12-15, 1917.

medical men of America, which at present is largely the reason why so many people are uninterested in malaria control. With application of proper antimalaria measures our food shortage problems would not have been so serious as they have been allowed to become.

The United States Public Health Service and the Medical Department of the Army fully realized the importance of malaria control measures at the military camps and that the mere establishment of boundary lines of military cantonment areas would not prevent introduction and spread of malaria among soldiers. It was, therefore, decided that the military authorities would care for mosquito and malaria control measures within the cantonments and that the United States Public Health Service, with the assistance and co-operation of the state, county and city health officers, would undertake such practical measures as were necessary to prevent Army men contracting malaria from beyond the military reservation lines. The hearty co-operation that has been given by the health officers of the different communities is a credit to the medical profession.

In general, five areas were considered as needing attention or control measures:

1. A strip of land one mile wide surrounding the cantonment from which anopheles could reach the cantonment area.

2. The inhabited area between the military reservation and the nearest town or village.

3. The town near the cantonment in which the soldiers and officers would spend their furlough periods.

4. A strip of land surrounding this town and from which anopheles could enter it.

5. Amusement parks and other places where the enlisted men would probably be after sundown.

In taking up the work at each locality we have made a rapid survey to determine the nature, extent and cost of antimalaria operations at the town, that is, for drainage and oil application; presented the survey and cost estimated to the town authorities and obtained appropriations for the necessary work and its maintenance.

For the area surrounding the cities and beyond the cantonment lines surveys were made and financial assistance received from the county authorities. Also funds were advanced from the American Red Cross for work in the county area. Proper ordinances were passed by both city and county authorities to prevent the production of mosquitoes in water containers which resulted largely in the removal or elimination of water-holding vessels.

At some of the towns cases of malaria were of frequent occurrence and anopheles breeding places very numerous. Also large numbers of mechanics and laborers had recently arrived from distant points, living in the town and working at the cantonments. In some instances this new influx of population contained more malaria-carriers than were originally in the city, and where anopheles were present, created a new condition very favorable to an increase of malaria. It was necessary to prevent mosquito production at once in order to get control of the situation. Therefore, as rapidly as possible after funds were available, oil was applied to all natural water surfaces, pools, swamps, streams and ditches by means of knapsack sprayers. Following this, ditching gangs were organized to drain swamps and pools, train streams and reduce the amount of water surface area that would otherwise have to be kept treated with oil. This work is about completed at eight cities and well under way at five others in the Southern states.

The production of anopheles in containers is, generally speaking, only a small item in malaria transmission because of the relatively large number of anopheles produced in natural bodies of water as compared with those from artificial containers and because of the general preference of anopheles for the former. However, now that the natural bodies of water are under control, particular attention must be given to water containers near houses which will become the only remaining places for anopheles production. The cost of maintenance of the streams and breeding places necessary for mosquito control will probably be about one-third or less than the cost of the first year's work. Careful inspection has shown that the enlisted men on furlough in town

scatter pretty well over the entire area and the protective measures taken were essential for their protection.

In the large areas surrounding the cantonments which contain many square miles, the stream banks are often inaccessible, due to the heavy brush and green brier on the banks. Where necessary this brush was removed and the cost has been from thirty to one hundred dollars per mile of stream. In all such streams the water surface current near the edge is considerably retarded and anopheles larva are to be found at many points where the surface current at the centre is comparatively swift. It is generally necessary to make a pathway along the stream bank to enable the laborer to distribute his oil properly. Also the removal of brush has a marked effect in drying streams and reducing the amount of oiling necessary. Due to the heavy demand for labor at the camp sites it was necessary to take such labor as was available and by gradual elimination select men suitable for mosquito control work.

Where the streams had a fair current, oiling was done by means of drip cans and the oil film carried and distributed by the current. The cans being placed about four to the mile or less, according to the local conditions. When the stream flow was insufficient to warrant the use of this automatic application of oil, the Myers knapsack sprayer was used for oil application, as this instrument proved satisfactory and will stand considerable hard usage.

Throughout the Southern states the latter part of the mosquito season was unusually dry, so the amount of oiling to be done was below that of normal years. In many districts, by using a small motor truck or wagon body on which an oil tank was installed, the amount of work accomplished by the oiling gang has been doubled. In other localities it has been found more advantageous to establish small oil depots or have barrels of oil with lock and key faucets at convenient points.

At several cantonments the stream beds are of such a character that it is not practical to train the water to a narrow channel, as it would be changed by the next rainstorm, but wherever the texture of the soil allowed of training of the stream or ditch bed so as to keep the flow in a narrow channel, this work was accomplished.

Near Columbia, S. C., the stream beds are of fine sand and except at the upper ends the stream beds must be left in their natural condition. Close to cantonment at Camp Jackson, Columbia, is a large swampy area that varies in depth from a few inches to ten feet. It is covered with vegetation and contains much brush, heavy growth and tree roots on the surface. It will be necessary to dredge a channel several miles in length to drain the swamp properly. The dredging operations are now under way. During the mosquito season we controlled the situation as far as possible by having the laborers wade out into the swamp to oil the water surface and also by using boats.

At Alexandria, La., the ground is very flat and breeding of anopheles occurs in the street ditches during wet periods. Cases occurred where the ditch produced anopheles around two, three and all sides of the block. There are two bayous close to this city which must be controlled from boats, as was done in the lakes at Panama.

At Quantico, Va., where Dr. Carter directed the work, it was essential to use tide gates to prevent flooding of lands by the tidal fresh waters of the Potomac. He will tell you of interesting development of anopheles in the large and long hammocks of eel grass in deep water, well off shore near naval camps, as well as of work done in Virginia and Maryland.

The anti-malaria operations referred to have been carried on at the cities and camp sites in South Carolina at Spartanburg, Greenville and Columbia; at Macon and Atlanta, Ga.; at Montgomery and Anniston, Ala.; Hattiesburg and Jackson, Miss.; Louisville, Ky.; Portsmouth, Petersburg and Quantico, Va.; Memphis, Tenn.; Little Rock, Ark.; and Alexandria, La. In addition, surveys are being made for similar control at several of the aviation camps and their nearby cities. So in addition to the protecting of our Army, the vicinity of more than fifteen of our important cities of the South have taken steps that will go a long way toward the eradication of malaria. At Little Rock, Ark., which had been a malaria locality, but is no longer so, the Commanding Med-

ical Officer of Camp Pike informed the writer that although many of the men came from sections noted for malaria, no new cases have been contracted at the Camp nor in Little Rock. The area cared for contained over seventy square miles and new men had to be trained to attack the task properly and effectively.

DISCUSSION

Dr. C. C. Pierce, United States Public Health Service, Camp Pike, Little Rock, Ark.—The paper read by Mr. LePrince is of particular interest to me, as I have the privilege of being in charge of the sanitary work around Camp Pike, Little Rock. I would like to emphasize one or two points by going more into detail. We found the situation there difficult to handle on account of the ditches we had to keep drained. We had rock bottoms to contend with, and there was considerable difficulty in draining the streams permanently, so that practically all work done there has been in a measure emergency, which must be done quickly in order to control the mosquito breeding problem.

Mr. LePrince has said that when we control the breeding anopheles and streams and pools and natural breeding places, the female anophele lays her eggs where there are collections of water, covered spaces, rain water barrels, and so forth, so that it becomes very important to guard against these things as far as possible from a malaria control standpoint, and it also has a very important aspect in satisfying the local people in controlling the mosquito-breeding problem.

After working in Little Rock for three months we made an effort to get some accurate statistics which would be an index to the results of our work. Just as Mr. Hoffman has said, and every one else who has discussed this subject, when you try to get data about the prevalence of malaria that has not been hammered into you for a long time, you can not get it. There is only one doctor who had accurate statistics of the cases of malaria he had seen and treated, giving the diagnosis as to whether it was tertian or estivo-autumnal, giving the time of the year the malaria occurred. And out of the doctors in Pulaski County there were only two, one in a city and one out in the County, who had accurate statistics and could show the reduction in malaria, from the deaths due to this disease. In a meeting of the Pulaski County Medical Society many of the men got up and said they were satisfied that there were fewer cases of malaria now than last year, but that indefinite statement of facts we can not publish.

Again, of the men who are drafted from all over Louisiana, Alabama and Arkansas and sent to that Camp, very many of them are chronic malaria-carriers. They carry the parasites in their blood, notwithstanding they have been taking chill tonics which contain a little quinin. It is important to free the blood of these men of the parasite so that they will not infect the anopheles.

I do not think I ought to talk about this work without saying we had excellent co-operation from the local boards of health in Arkansas, from the State Health Officer, Dr. Garrison, and the Health Officer in Little Rock. All of them have co-operated with us in a most cordial and helpful manner.

When we get business men interested enough to put up their money for the control of communicable diseases, you have that community in such a state that you can accomplish something and until we consider and work on these problems from an economic and commercial point of view, we can not expect to accomplish very much. I believe it would be an excellent idea to present such papers as this to commercial organizations, because after all we can get together every week and talk ourselves hoarse as to what should be done, and what can be accomplished, yet we do not accomplish anything unless we get the business interests of a community behind such a movement.

Dr. Joseph H. White, United States Public Health Service, Memphis, Tenn.—What I may say at the outset may seem a little irrelevant to the subject of malaria. I was impressed in 1906 by the fact that merely as an incident of yellow fever in New Orleans the malaria rate in that city had been reduced one-third of its preceding status. There was no attempt made to find the malarial parasite; oiling and other measures were applied to artificial containers running out into the natural breeding places of the anopheles, and this resulted in a very marked reduction in the malaria rate the next year, and I believe Dr. Bass and others here will bear me out in saying that reduction continued for two years afterward.

Mr. LePrince spoke about the economic aspect in connection with malaria. The reason we do not get a bigger crop of food for our Allies is because our best lands are not cultivated. Following this observation of mine, in 1906, I reported to the Alabama State Medical Association that it was my belief that we ought to utilize this very thing. We ought to utilize the fact that malaria reduction can be made of economic benefit, and vice versa, that the economic use of the soil can be made a factor in malaria reduction. If you think of it, you will find it is true. The whole history of malaria and malaria countries points that way. It is the reclamation of soil from swamps which will reduce malaria in many heretofore hideously malaria districts. You may remember that Napoleon said that if he could keep the stupid British in the swamps of Holland long enough, malaria would fight the battle for him. There are now no swamps in Holland, and hence no malaria.

There has been a pushing back of malaria in several parishes of Louisiana by the economic use of the land, and the reduction of the malaria rate in these parishes to my knowledge, as far as knowledge can be exact from hearsay, has been two-thirds. Many of the most reliable doctors

in the parish of Terebonne are positively certain that they do not have any more than one-third the malaria today that they had fifty years ago when the swamps were closer to human habitation than they are now.

We can not stress too much for our purpose the utilization for agricultural purposes of swamp lands, so that the lands can be made attractive and a source of revenue. I do not think we ought to neglect opportunities like this, but should drive this one argument home to the laity with all the force we have in our possession. Nothing can help us more in obtaining the sinews of war for this fight. I hope that my friend, Mr. Hoffman, will help us carry that argument along. He is good at things like that.

As to the paper itself and the question of cantonments and surrounding areas, I heartily agree with everything Mr. LePrince has said. I have seen some of the work, although in my own work inside the cantonments I have been rather too busy to be able to give the time that I wanted to the work on the outside. Still I know it has been done and done just as it has been stated. Invariably inside we have endeavored—and I hope the work has been completed; I know it has in many instances—to eliminate entirely all possible breeding places for anopheles inside the camps and cantonments. I know in several instances that has been done with the utmost exactitude.

I have advocated the complete elimination of everything in cantonments that might serve as breeding places for mosquitoes, and my recommendations were accepted and their fulfillment promised by the constructing quartermaster and medical officer in charge of each camp where I went.

As I am partially responsible—probably more responsible than anybody else—for the possible error with regard to the breeding ground of anopheles to which Mr. LePrince has alluded, I want to say something about that. Concurring in all he says, I want to say this: the first observation to the effect that a certain class of mosquitoes, namely, the Aedes Calopus, breed entirely in artificial containers was made by my friend, Dr. Carter. He insisted, and rightly so, that this was a factor of tremendous importance in considering an epidemic of yellow fever. I have insisted in season and out of season on this because I considered it not only a factor of tremendous importance but a factor without the recognition of which it was absolutely impossible to win our fight against yellow fever in a big community like New Orleans. I insisted so much that it is possible and probable that my insistence may have conveyed a wrong impression regarding other varieties.

I want to go back and insist upon what I said about the economic aspect of this question, because I believe through stressing it we can get help we could not get otherwise in the elimination of malaria-breeding places. Of all lands on the face of the earth for rich agricultural production, none equals the breeding-places of the anopheles.

Dr. Arthur T. McCormack, Bowling Green, Ky.—The United States Public Health Service in the zone about Camp Taylor at Louisville appropriated $7,000 and the Red Cross put in $10,000, and as a result of these two expenditures very excellent work has been done.

Every stream within a mile of Camp Taylor on the side next the city of Louisville has been rechanneled and oiled throughout the zone, and every stream on the opposite side has been rechanneled and oiled five miles from the camp.

Another point I wish to bring to your attention is this: the question is not only the protection of our soldiers from malaria but, equally important, the protection of the people in all the areas about these camps, and then the protection of the soldiers and people of our Allies from malaria-stricken soldiers, which up to the present time has not been demanded, and toward the danger from which practically nothing has been done.

I think this body should go on record as insisting that it is up to the Medical Department of the Army to see that the first thing it does in the sanitation of camp zones is to provide proper latrines and a proper sewage system. There should be means provided for the examination of every soldier that comes from a Southern state for intestinal parasites and for malaria.

I want to say that I believe it is of supreme importance not to send a regiment of Southern soldiers to France or to Italy unless these men have been previously examined for malaria. We have no more right to poison the soldiers of our Allies with malaria than we would have to poison their food with arsenic. I believe that should be burnt into us. We should say it, and then do it.

What is actually happening? In recent visits to a number of camps I found them examining for malaria-carriers with Wright's stain. Of course, in this section of the country those who use the microscope have forgotten that this stain was ever used for malaria. It is left almost to the younger men to use the Wright stain, and I want to say to the young men here that you are largely responsible for that fact because you ought to be able to make these examinations and not expect men from the North, who are not familiar with the subject and know practically nothing about it, to adopt our method. You were making these examinations before these pathologists and bacteriologists, who know very little about the practical methods of examination for malaria.

I take it we are not going to send our troops abroad with malaria and hookworm disease if we know it, but that we will all get busy and properly examine these men rather than trust them to those who do not know anything about these maladies. It behooves all of us to get busy and do some of the work. We have done very little in the past, and what little work we have done has been sporadic. This is a work in which we have got to get busy. We must first get our hearts right with God, get up to date as to methods, and then get busy about the problems before us if we would help solve them.

Dr. Oscar Dowling, Shreveport, La.—The Louisiana State Board of Health volunteered to examine men in the camps of Louisiana some time ago, and we told the commanding officers repeatedly that we were able to do it. We sent men at different times to get specimens and found some of the cases were removed to another town. We examined less than one-third of the men for hookworm disease, and a little less than one-half for malaria. Of 1,600 men examined we found only three showed positive malaria. We found 9 % had hookworm disease. We were willing to do the work, but we did not have the entire and hearty co-operation of the commanding officers in getting specimens for examination.

Dr. William Krauss, Memphis, Tenn.—I think the biggest thing that has been brought out by Mr. LePrince is the lamentable fact that we have not more Mr. LePrinces. I have personally seen that man do what is beyond comprehension, and a man who knows engineering problems of malaria as well as he does, it seems to me, would better be employed in training other men to do the same work. I think the United States Public Health Service ought to establish a training school for sanitary engineers with Mr. LePrince in charge, and give him nothing else to do. A big thing in the handling of malaria is the question of competent engineers who know enough mosquito control to be of real benefit where they are sent.

Dr. H. R. Carter, United States Public Health Service, Baltimore, Md.—In June of this year I went to Washington on a stretcher owing to an accident that happened on Lake Charles. There the problem confronted us as to what could we do most to assist in national defense. I can say that I had a good malaria program laid out for this year, but I dropped all of it and turned all of my efforts into camp work, and they have not been without result.

We have been able to handle this year twenty-seven communities connected with camps. These communities are large enough to contain something between 450,000 and 650,000 people. I am speaking only of the civilian communities, and really our civilian work this year is bigger than if we had not dropped malaria investigations and gone in to help the Army.

SOME RESULTS OF MALARIA CONTROL BY CONTROL OF THE INSECT HOST: PUBLIC HEALTH AND ECONOMIC ASPECTS*

By R. C. Derivaux, M.D.,
Passed Assistant Surgeon, United States Public Health Service,
Washington, D. C.

By malaria control by control of the insect host is understood malaria prevention by concentration of attack upon the mosquito intermediary between parasite carriers and their non-infected associates. To this end are available two principal avenues of attack—prevention of production of anopheles as far as is economically practicable, and prevention of access of the remainder to the population it is desired to protect. The advantages of the first method, that of mosquito reduction, are manifold and, more especially under community conditions, have been shown to be potentially productive of by far the greatest and most permanent results.

It is purposed in this review to present a synopsis of results gained in a number of control campaigns conducted under the advisory supervision of the United States Public Health Service, with especial reference to the proportionate reductions obtained in ratio to their respective costs. In most of these, control of anopheles production has been the chief, and, in most, the sole measure applied; comparative data from selected places are graphically represented on the accompanying charts.

ROANOKE RAPIDS, N. C.

As has been previously described, malaria control operations, chiefly through the use of measures directed against anopheles production, were begun at Roanoke Rapids, N. C., a cotton mill town of about 4,100 people, early in 1914. Between 1910 and 1913 about 75 % of the population are said to have suffered from malaria, and during July, August and September of 1913, medical calls for malaria had averaged about 50 per day, in some instances 3 to

*Read before Conference on Malaria (National Malaria Committee), Southern Medical Association, Eleventh Annual Meeting, Memphis, Tenn., Nov. 12-15, 1917.

7 members of families being simultaneously sick. The progressive decrease in the incidence of malaria up to 1916 is shown in the accompanying tabular sum-

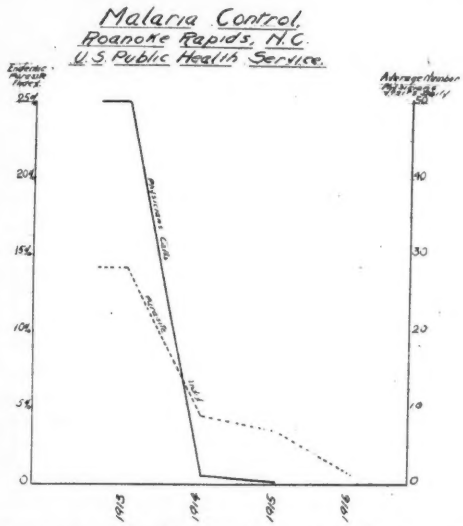


Fig. 1—Roanoke Rapids, N. C. Curves of comparative endemic parasite indices and of average daily visits for malaria by physicians, as influenced by mosquito control measures.

mary of 4 successive endemic parasite indices taken in 1913, 1914, 1915 and 1916, all in October:

October, 1913, parasite index.....13.75 %
October, 1914, parasite index..... 4.48 %
October, 1915, parasite index..... 3.51 %
October, 1916, parasite index..... 0.53 %

This represents a reduction of 85 % between the last two indices and a total reduction of 96.15 % since the beginning of operations. No data for 1917 are as yet available.

In the daily average of calls made by physicians for malaria during July, August and September on the relative reduction in incidence may be comparatively shown as follows:

In 1912 and 1913, about 50 visits per day.

In 1914, about 1 visit per day.

In 1915, about 1 visit per three days.

The costs per capita for this degree of control were 80 cents in 1914 and 27 cents in 1915. Those for 1916 and 1917, while not available, are said to have been still further reduced. The gain in efficiency of the working personnel under the influence of this work has been estimated by the mill managers as from about 50 % during the four most malarious months of 1913 to about 95 %, and the net gain from funds expended for control work has been characterized by the manager of one of the mills as the "quickest and most enormous returns I have ever known from any investment." This was probably between 400 to 1000 %. Here the former sinister role of malaria as a retarding factor has been eliminated and the single cause for practically all of their preventable illness removed through the one line of attack of control of mosquito production. Graphic illustration of the proportionate gains referred to above are given on the accompanying chart.

ELECTRIC MILLS, MISS.

Systematic malaria control work by control of the insect host was undertaken in Electric Mills, Miss., a lumber town of about 1,000 population, in 1914. Prior to

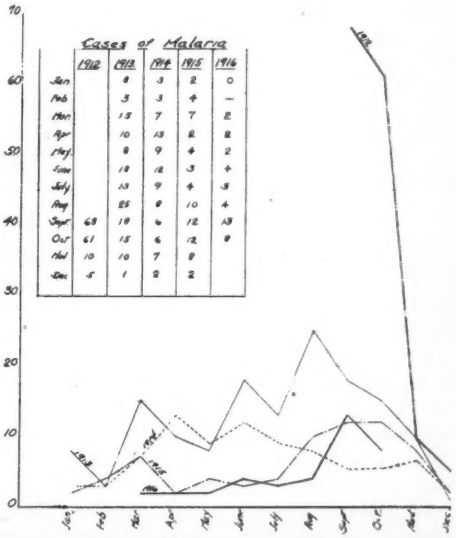


Fig. 2—Electric Mills, Miss. Monthly distribution of reported cases of malaria from September, 1912, to September, 1916.

this time the influence of malaria had been serious, exercising a very marked influence on labor and constituting about 95 % of all illness during the month of September of 1914. The endemic parasite index as determined in May of 1914 was 11.76 %. The influence of the control activities, begun in 1914, is shown in the accompanying chart, Fig. 2, giving the monthly distribution of cases of malaria from September, 1912, to and including October of 1916, the last period for which data has been received. The repeated endemic parasite indices may be summarized as follows:

1914	11.76 %
1915	3.79 %
1916	1.00 %
Reduction	91.00 %

As illustrated in the comparison of the report of cases of malaria for the last four months of three consecutive years, the reduction of malaria prevalence is as follows:

	Cases
Last four months of 1913	144
Last four months of 1914	44
Reduction	69.5%
Last four months of 1915	21
Reduction	85.4 %

These results have been obtained at a cost per capita of $1.21 in 1914 and of $0.24 in 1915. The general improvement here has been substantial; school attendance has been much increased and practically no losses of time because of malaria have been reported among the laborers at the mills and shops.

CRYSTAL CITY, MO.

Consequent to a request received from the Pittsburg Plate Glass Company, a malaria survey was made of Crystal City and the adjacent town of Festus in December of 1915. Active measures for the control of mosquito production were begun during the early part of the following year and have since been continued as a routine. The results of the work here have been excellent. Comparative parasite indices, determined in December, 1915, prior to the control operations, and in the same season of the following year, 1916, were 5.62 % and 0.93 %, respectively, a reduction of about 83 %. The economic influence of malaria reduction as manifested among the workers in the plant is well shown in the diminution of insurance claims paid for reason of disability from malaria as follows:

1915	$230.22
1916	61.68
1917 (Jan. 1 to Oct. 31)	63.00

Prior to control work, 25 % of the working force of about 1,300 is said to have been affected by malaria, the average loss of time being about 6 days per man per year. During 1916 not over 25 cases occurred, and of these about 20 were stated to have been relapses. In 1917, cases of malaria are said to have been slightly more numerous, but have been restricted almost entirely to newcomers from the southeastern part of the State. At Festus it is stated by the Health Officer that malaria during 1916 was but about one-fifth of what it had been during the previous year.

The total costs of the first year's work, from December, 1915, to January 1, 1917, were $7,247.22, in which is included a cost of $675.00 for operations conducted in Festus. This, with reference to a total population of about 8,000 people protected, gives a per capita cost of about 90 cents for an estimated reduction in malaria of about 80 %. For the second year of operations, the per capita cost, as computed at the end of October, 1917, is approximately 54 cents.

CROSSETT, ARK.

In the co-operation with the International Health Board, an intensive demonstration study of malaria control, through the exclusive use of measures directed against mosquito production, was conducted at Crossett, Ark., a lumber mill community of 2,029 people, in 1916, and has been since continued by the town itself during the current year. Malaria here formerly constituted a very serious economic handicap and is said to have been responsible for more than 75 % of all illness. Following survey, a census was taken, parasite index determined, and active control operations were begun in

April of 1916. The following summary exhibits the more important data for the season:

Population	2029
History index of malaria	24.79 %
Parasite index of malaria	9.43 %
Total ditching, 17,265 lineal yards, approximately 10 miles.	
Total oil used, 1,350 gallons.	
Total cost	$2,506.40

Results.—The reduction effected in the incidence of malaria in Crossett and the costs thereof with reference to population may be shown in summary as follows:

Total cost malaria-control operations	$2,506.40
Total population (census April, 1916)	2,029
Per capita cost	$ 1.235
Per family cost, average	5.31
Reduction in incidence of malaria as ascertained by repeated parasite indices 9.43 to 2.61 per cent	72.33 %
Reduction as ascertained by comparison of total calls for malaria in 1915 and 1916	70.39 %
Reduction as ascertained by comparison of calls during the active season of 1915 and 1916	82.07 %

Figure 3 is illustrative of the monthly reported calls for malaria made by physicians and is an accurate index as to the progress of the work. This chart has been prepared from the monthly reports for the year of 1915, prior to operations and gives the data for 1916, as well as that for 1917, superimposed for purposes of comparison. During 1917, it will be observed that the greatest number of calls was reached in May, this number being due, it is believed, entirely to relapses. From this "peak" of 86 cases reported for May, a decline occurred through the summer and autumn, the period of the year that, in the absence of control operations, should have been marked by a rapid rise in prevalence. In October, ordinarily one of the two most highly malarious months of the year in this section, 600 calls are reported for October, 1915; 46 for the same month of 1916, and but 14 in October of 1917, a total comparative reduction of approximately 98 %. The net diminution obtained in Crossett at the end of the first year's work may be derived by comparison of the total calls for this disease in 1915, with those of 1916, as follows:

	1915	1916	Reduct'n %
Total professional visits and consultation for malaria	2502	741	70.39
June to end of year (eliminating as much as possible the influence of recidives	2220	408	82.07

The continued influence of these operations as now carried on under the direct supervision of the Crossett Lumber Co. is also shown on this same chart. As will be observed, few cases were carried through the cold months to give rise to any marked increase during spring. An apex of 31 calls may be noted for the month of May, followed by a steady decrease in June and July. A rise to 33

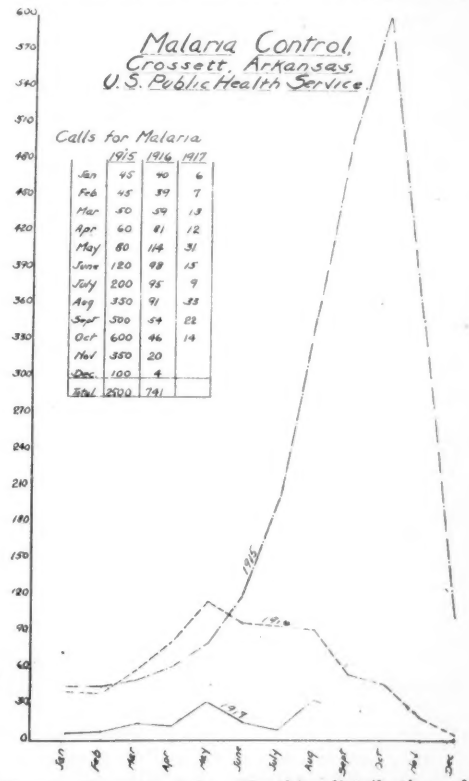


Fig. 3—Crossett, Ark. Monthly distribution of physicians' calls for malaria in 1915, 1916, and 1917. Measures for the control of mosquito production were begun in April, 1916.

calls is reported for August, largely due to illness among immigrants into Crossett from other sections of the country. Compared with the first year, in which the cost of this work totaled $2,506.40, or $1.235 per capita (about 10 cents per month per capita), the total cost for 1917 should not exceed $1,000, or less than $0.50 per capita.

The following quotation is taken from a letter of the Assistant Secretary-Treasurer of the Crossett Lumber Company, Mr. A. Trieschmann:

"While much might be said in favor of the campaign that has been conducted, there are a few results that deserve special emphasis, purely from the standpoint of labor efficiency.

Living conditions have been much more attractive, purely from the standpoint of comfort resulting in a certain kind of contentment that would not have been possible otherwise.

Comparing conditions with former years, our pay roll and hospital records show a large number of employees who were idle on account of sickness, principally due to malaria, whereas during the past twelve months there has been practically no shortage of labor from this same cause. Our industry as well as others have suffered on account of the scarcity of labor on account of Army volunteering and furnishing quota due to the draft. Hence if in addition to these unusual demands upon our men, we were further handicapped by the usual amount of sickness as was the rule in former years, our production would have been decreased at this time at least 33 %. We have been maintaining a thorough antimosquito campaign during the year for less than $1,000, and no other investment that we have made will bring us as large returns."

CROSSETT LOGGING CAMPS

At the two logging camps of the Crossett Lumber Company, situated 12 and 26 miles, respectively, south of Crossett in the pine woods of southern Arkansas and northern Louisiana, illness due to malaria has heretofore constituted a most serious problem. The two camps have a population of about 450 persons each and are well constructed and thoroughly cared for in every way. Water supply in both is derived from deep wells piped to the houses, all of which are electrically lighted. At the upper camp, which was established in 1912, a total of 2,884 professional calls were made during 1915, and of these 1,298, or 45 %, for malaria. At the lower camp, established in October, 1915, mosquitoes were exceedingly numerous and 148 cases of malaria were recorded during their first month of occupancy. Of 2,044 calls made in 1915 at this camp, 1,451, or 71 %, were because of malaria. Following a survey in May of 1916, active operations to control mosquito propagation were at once begun and control secured before the beginning of the active season. As a result an estimated reduction in malaria of about 75 % was obtained and maintained during 1916. Exact data have not as yet been available. Up to June 1, 1917, but 5 cases have been clinically diagnosed as malaria in the two camps; and of these, one was later shown to be tuberculosis. The estimated per capita cost at both camps is about 95 cents for the first year's work and has since been reduced fully 50 %. As a result, malaria as an unfavorable influence has been entirely eliminated, and the physician in charge of the camps has been able for the first time to attend to his first duties, those of disease prevention.

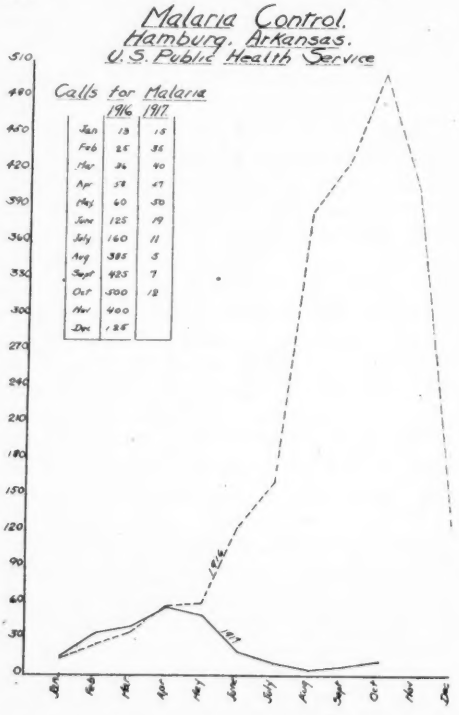


Fig. 4—Hamburg, Ark. Monthly distribution of physicians' visits for malaria in 1916 and 1917. Measures for the control of mosquito production were begun in April, 1917.

HAMBURG, ARK.

A second intensive demonstration study is being conducted this year in co-operation with the International Health Board, and under the personal direction of Dr. H. A. Taylor, at Hamburg, a town of about 1,300 inhabitants and the county-seat of Ashley County. Here, as at Crossett, measures for the control of mosquito production are being exclusively employed, and very similar general results are being obtained. Figure 4 is illustrative of the comparative distribution of professional calls for malaria reported by physicians in local practice as contrasted with the estimated distribution of visits for the same months of last year. As this work is still in progress, its detailed data are as yet not available.

DALLAS, TEXAS

In accordance with recommendations made after survey by representatives of the United States Public Health Service, extensive mosquito control operations have been conducted in Dallas, Tex., and vicinity under the direction of Mr. Charles Saville, from whose published report the following results have been taken:

During the first year ending August 31, 1917, before the work had well begun, there occurred 27 deaths from malaria in Dallas, whereas during the following 12 months but 9 deaths are recorded, a reduction in mortality of 67 %. In June, July and August of 1916, 95 cases of malaria were reported to the Health Department of Dallas as having originated in town, whereas in the same three months for 1917 but 10 cases are so recorded, a reduction of about 90 %. During July and August of 1916, 85 cases were treated in the City Hospital with a total of 585 hospital days, whereas in the same months of 1917 four cases of malaria received professional attention for a total of but 32 hospital days.

The cost of this excellent work carried on by the City of Dallas has been estimated at about 3 cents per capita, or about 15 cents per home.

WILSON, VA.

Malaria control operations were undertaken at Wilson, Va., a place of about 480 inhabitants, following a survey visit in October of 1915. Exact data are not available, but at this time it was stated that no homes were without one or more cases, in some all occupants being attacked, and that 5 deaths from cerebral malaria had occurred during a single month, August. In 1916 but one case of malaria occurred, this on May 20, and was clearly a relapse.

EMPORIA, VA.

Systematic anopheles control work has been carried on at this place under the direction of the Virginia State Board of Health. Repeated parasite indices to measure the control gained were made and a reduction from 9.4 % in 1915 to 3.0 % in 1916 obtained, a total reduction of 68.09 %.

The foregoing summaries are illustrative of what has been accomplished in various sections of the United States and of the degree of control obtainable at what are believed to be relatively small costs. Selection has been especially made for this synopsis of such places for which suitable data for comparative purposes have been collected, but results of probably equal excellence have been similarly obtained where less detailed records have been available. Among these may be mentioned Tyler, Lufkin, and Keltys, Tex.; Texarkana, Ark.; Sherman, Waxahatchie and Marlin, Tex; and Gilmerton, Va.

DISCUSSION

Dr. John A. Ferrell, New York City.—In connection with the paper by Dr. Derivaux I might say that the results in the control of malaria at Crossett and Hamburg in the State of Arkansas have been most gratifying. Four other towns in the State have requested that similar work be carried on for them, with the understanding that they will bear all expense connected with the work except that of general supervision. Arrangements are accordingly being perfected to extend measures similar to those at Crossett and Hamburg to Lake Village, Monticello, Dermott and Bauxite, and also to continue a certain amount of supervision of the work at Crossett and Hamburg. Dr. H. A. Taylor, who has been connected with this work from the beginning, will have immediate supervision of it and his headquarters will be at Lake Village, Ark.

Dr. Charles W. Garrison, Little Rock, Ark.—With regard to what Mr. Rose said, namely, that he found no place in this meeting for laymen, I would like to say that I feel that the laymen have outstripped the medical profession in much of our public health work and propaganda. Right now in Arkansas we have more demands from the typical Delta farmers to undertake intensive community health work and malaria control measures than we can meet, owing to lack of trained health workers.

I want to take this occasion, in the name of the Arkansas State Board of Health, to thank the United States Public Health Service and the International Health Board for the valuable services they have rendered to Arkansas. I have never called upon either organization without receiving a ready response, and I am glad to say to my people that we can now secure assistance from Washington when needed to protect human beings just as we protect our stock.

Dr. Derivaux, in his discussion of the rural work, omitted reference to screening. A rural unit, consisting of typical Delta homes occupied by tenant Negroes, was chosen for demonstration. These houses were carefully screened under supervision of the United States Public Health Service and for a period of eight months, beginning in the early summer of 1916 and ending January 1, 1917, these houses were visited weekly and careful instructions were given to the tenants, including the small children, concerning the reason for screening houses and the good to be derived therefrom. On the date last referred to the supervision was withdrawn and this summer, eight months afterward, the results were checked up and the cottages were found to be well screened and well preserved. Where little holes had been punched in the screening, the Negroes had taken pieces of screen wire and patched the holes.

That justifies, I think, the contention that intensive public health work will secure the constant co-operation of the people, as was pointed out by Mr. Hoffman this morning that publicity or education was the means through which we were to accomplish many things. The subsequent speakers have brought out the fact that it must be intensive education. If we pursue diligently and persistently our efforts along this line we can secure the co-operation of all the people.

It seems to me the medical colleges and other organizations are not measuring up to the present requirements in training more men to take charge and properly direct public health work that is in demand.

Dr. C. C. Pierce, United States Public Health Service, Camp Pike, Little Rock, Ark.—There is one point that ought to be discussed, considering the relative value of the control of malaria through quinin sterilization of the blood or immunization and control of the insect host.

Every bit of filling and drainage to control mosquito breeding adds to real estate value very materially. There is much value attached to that work which can not be shown by any statistics of per capita cost and incidence of reduction of disease at the time the work is going on.

Dr. Derivaux (closing).—There is but little to be added in closing to what has been brought out in connection with the discussion. I should like to state with reference to what Dr. Garrison has brought out in discussion of the rural studies conducted in Arkansas in co-operation with the International Health Board that I have just returned from a reinspection of the "screen units" of that series of studies. In this work, 33 houses were experimentally screened at an average cost of $14.22 each. These were not selected, and represented about the average of typical plantation houses. At the resurvey referred to I found practically all the screening installed,—and this after two years of service,—in quite good condition with the exception that chimney caps had not been replaced. At one house, that of an Italian, I found one of the screen doors sagging badly and a small hole punched through the bottom panel of screen near the level of the floor. I spoke to the occupant regarding the needed repairs and asked him if the protection against mosquitoes and malaria did not warrant his maintaining his screens in good condition. When next I saw him I found that he had procured the necessary No. 16 galvanized iron screen and had made the repair. In this particular case, I think the seed has fallen on fertile ground.

In this series of rural studies each family was seen at least once each week and premises were inspected practically as often. The groups to which quinin was issued for immunization or sterilization were regularly questioned with reference to the amount taken, how it was employed, etc., and the lessons of its use repeated to them continually. There was, I believe, very little chance for failures of understanding. In the resurvey just finished, I came into contact with but few of those to whom quinin was issued last year, and of those I questioned I am sorry to state that none saw fit to continue its use this year.

Mosquito host control operations are no more a panacea for the malaria problem than is quinin. The discussions of today have brought out very clearly that all methods of control have a distinct value and distinct indications in the presence of which they should be employed.

THE BEARING OF MALARIA ON RAILROAD OPERATION*

By H. W. Van Hovenberg,
Sanitary Engineer, St. Louis Southwestern Railway Co. ("Cotton Belt Route"),
Tyler, Tex.

The matter of health protection for employees of large business enterprises has long since passed the experimental stage. Protection of health leading to increased efficiency, better social conditions, and greater contentment among laborers is now accepted as a paying investment of the highest order. A few years ago we would not have found a railway which maintained a department for the purpose of protecting the health of its thousands of employees; nor would we have found

*Read in Conference on Malaria (National Malaria Committee), Southern Medical Association, Eleventh Annual Meeting, Memphis, Tenn., Nov. 12-15, 1917.

the trained railroad geologist, the chemist, or the agricultural and industrial commissioner.

There has recently come into being a new conception of railroad management embodying co-operation between the public service corporation on the one hand and the hundreds of thousands of people served. Vast agricultural areas are being opened, thousands of fertile acres are now producing the foodstuffs so necessary to our national existence, due to this newer phase of railway management. We now have the farmer taught proper methods of dairying, of live stock raising, that he may prosper and in turn bring profits to the railroad. Some health protective agencies have been thrust upon the railroads for the protection of employees and the public, such as safe drinking water, drinking cups, and pure ice supply. Other protective activities have been inaugurated by the railroad, such as the "Safety First" movement, the teaching of first aid among employees, and the employment of sanitarians to look after the proper construction of toilets, ventilation of offices, proper feeding of work crews, and within the past few months of the creating of a department of the St. Louis Southwestern Railway Company devoting its entire time to the elimination of malaria from among some 15,000 employees working over approximately 2,000 miles of trackage in five states.

Anti-malaria work as undertaken by the St. Louis Southwestern Railway was inaugurated through a study of the records of the Employees Hospital by Mr. Edwin Gould, Chairman of the Board of Directors. Mr. Gould found that over a period of four years 25 % of all patients entering the Hospital were being treated for malaria and that approximately one-fourth of all the medical and surgical relief furnished at this institution was devoted to the treatment of malaria patients. He found that there had been an annual average of 640 cases of malaria treated at the Hospital during the past four years and that each patient remained for treatment over an average period of five days. These startling figures did not include the hundreds, and more likely thousands, of men treated for malaria by local surgeons. Here was a problem indeed. It was obvious that a point of high efficiency among the thousands of employees could not be reached while malaria had such a grip on their energy and vitality.

The relation of malaria to the management of labor on the railroad becomes obvious when we consider some of the ways in which malaria increases tremendously the burden of both employer and employee. We will discuss this relation under a few distinct heads:

1. There is a turnover of labor many times during the season caused by malaria-infected men leaving the work gangs for hospital treatment, and by reason of infected men joining the gangs only to leave at the end of one or two days' work. One of our largest corporations has discovered that it costs them an average of $300 for each new employee added to the force. I do not know what it costs the St. Louis Southwestern Railway in this connection, but it is a very definite charge against labor operation amounting to dollars rather than cents. It is expensive indeed to control this erratic labor. A foreman never knows how many laborers he will have ready for work, and a superintendent is never certain that a foreman can complete his work on time to this uncertainty.

2. There is a large class of railway employees, including ticket agents, clerks, telegraph operators, and others more or less skilled who have necessarily spent many years in mastering their line of work. Many of these employees are exposed to malaria infections, and the railway often pays for time lost and supplies less skilled labor in their absence. It is obvious that the positions of employees who have passed through years of training can not be filled temporarily, without the possibility of error, without chance of accident, and without certain delays that may be of serious import.

3. We have a large number of skilled employees working about machinery. Sickness from malaria among such men who are trying to work while infected means the likelihood of accident for which the Company will pay in full measure, means the mistreating of tools and machinery, and of far greater importance, a certain decrease in output. At this time in our Nation's history our very existence de-

pends in large measure upon our railways. Increased output of the car-building department means more equipment to carry foodstuffs and appurtenances of war for the use of our soldiers and sailors in the trenches and on the high seas. It is of prime military interest that our railroads meet the demand for service, and this service can not be rendered to the greatest extent without men working at their maximum efficiency.

4. Perhaps the greatest financial loss to the railway is due to the very large number of light cases of malaria which do not even receive the attention of the local physician, or of any physician for that matter. I mean such a case as a man trying to work and to give a fair return for his wages, but who can not do so, because of the fever. Such cases are numerous in communities where high malaria rates prevail.

5. The contentment of a laborer has much to do with his efficiency. Naturally a man working in a malarial locality with his wife and children sick with fever, with his savings going to pay the doctor or undertaker, can not be a happy and contented employee. Loss of wages alone is a very serious factor, often leading to economic distress and abject misery. Again an efficient and conscientious employee looks forward to advancement. His general efficiency and record for always being on duty is much in his favor. The man who is suffering from malaria and who is off duty from time to time is not favored when the opportunity comes for advancement.

Early in the spring of 1917 the income from a trust fund created by Mr. Gould was made available for anti-malaria work. The fund is being expended with two distinct purposes in mind: (1) to increase the efficiency of the railway labor and to decrease the number of hospital cases resulting from malaria infection; (2) to serve the public by co-operation with cities and towns and business enterprises in ridding their respective communities of malaria and thus doing health protective work of the highest order.

Anti-malaria demonstration work of the St. Louis Southwestern Railway was organized by officers of the United States Public Health Service, including Mr. J. A. LePrince, so well known for his monumental work in Panama, and Drs. R. C. Derivaux, T. H. D. Griffitts, and L. L. Williams, Jr., of the Malaria Investigation Branch of the Service. The demonstration work in Lufkin, Tyler and Keltys was well started when these gentlemen were recalled about July 1 to control the malaria problems about the Army cantonments and aviation fields, and at which time a sanitary engineer was employed by the Railway to continue their work.

The season's work embraced demonstrations of malaria control in the cities of Tyler, Tex., and Texarkana, Tex.-Ark., each with a population of approximately 17,000; in the City of Lufkin, Tex., with a population of about 3,000, and adjoining which city the large lumber mill of the Lufkin Land and Lumber Company is located, and in the two typical lumber mill towns of Keltys and Wildhurst, Tex.

The work in the cities and towns beforementioned consisted in the destruction of all possible breeding areas of the anopheles mosquito, or malaria-bearing mosquito, and in the removal of as many as possible of the breeding areas and containers of the common house mosquito, which, however, does not carry malaria. A demonstration of the value of screening the living quarters of extra gangs and B. & B. oufits was also carried on. Early in the spring most of the outfit cars and B. & B. department cars were screened, but no serious attempt was made to instruct the men living in these cars in the purpose of the screening, which would undoubtedly have been of great value.

ANALYSIS OF WORK IN THE CITIES

Early in May work was started in Tyler, a city in which there are approximately 700 St. Louis Southwestern Railway employees. For this work the city appropriated not to exceed the amount of $1,000 in labor and team hire, while the railway on its parts agreed to furnish all other labor and expense for the season's work. Briefly the results have been a decrease of 46 % in the number of employees admitted for malarial treatment at the Texarkana Hospital as shown by the comparison of the hospital records for the months of June to September, inclusive, of this and last year. A study of the prescription records of a Tyler drug store

chosen at random shows a decrease in the actual "quinin subscriptions" written for patients suffering with malaria of 49 % for the months of May to October, inclusive, 1916 and 1917. From several reliable sources I am told that the malaria sickness rate in Tyler was almost negligible this year. The Anopheles breeding areas in Tyler were kept under control throughout the summer with comparative ease. On the other hand, the propagation of Culax, or the ordinary house mosquito, gave us much concern. The complete elimination of this mosquito from Tyler must await education of the public and a livelier interest on its part in removing the breeding places from about private homes.

The work in Texarkana was started August 1 and anopheles breeding was under control within a few days. In this instance the cities of Texarkana, Ark.-Tex., shared alike in the expense of the demonstration work up to $600 for each city. I feel that the physicians and city officials of Texarkana took up anti-malaria work not solely from its being a good business investment, but because they felt it to be a very definite patriotic duty. With so many of her able-bodied men already at the front, or in the process of training, it was felt that the city could well afford to protect the health and vitality of those remaining, who were needed to carry on the business life of the city and to assist in the production of those appurtenances of war needed by our armies and navies. Neither city had available cash for this work, but readily accepted the offer of the St. Louis Southwestern Railway to accept script in payment of labor furnished by the Railway, said script to be applied in the payment of taxes.

I have been told that anti-malaria work will not be undertaken in several communities this year because of war conditions. I would call the attention of such communities to the City of Texarkana, and would say to them that there never has been in the history of this Nation a time when it was so necessary for them to undertake health protective work of this high order; that they can render to our Government at this time by taking up anti-malaria work, a service that is immensely patriotic and which will add much to the sum total of the energy and vitality so necessary if we are to win this war of freedom and democracy.

The City of Lufkin was chosen for demonstration work by officers of the United States Public Health Service because of its reputation for malaria sickness, and because of the occasional cases of malaria of the pernicious type reported in that vicinity. The St. Louis Southwestern Railway supplied for the Lufkin demonstration five-ninths of the cost, the other four-ninths being supplied by the Lufkin Land and Lumber Company and Mrs. G. A. Kelley, a club woman of Lufkin who is deeply interested in civic and public health matters. There are no public health records with which to interpret the result of the demonstration work in Lufkin. What was accomplished may possibly be shown through an analysis of the prescription records of the four drug stores. During the months of June, July, August, September and October the relative number of quinin prescriptions to the total prescriptions filled by these stores decreased from approximately 17 % in 1916 to about 7 % in 1917. The prescription records of the third largest drug store, but one in which records were well kept, show that there was an actual decrease of 310 in the number of quinin prescriptions filled this year from July 1 to November 1 compared with corresponding months of last year, amounting to a relative decrease of 82.6 %. The decrease in prescriptions at this one store alone if counted in dollars amounts to as much as the entire cost to the people of Lufkin for the anti-malaria work during the entire season. This does not take into account the saving to the people through not having to pay doctors' bills and the saving through not having to lose their wages. During the month of August, 1916, the four drug stores in Lufkin filled 447 prescriptions. This number decreased to 141 in August, 1917, or a reduction of 69.5 %. I am informed by Dr. O. M. Dillen, Company Physician for the Lufkin Land and Lumber Co., that he has observed a decrease from 85 to 90 % in the number of cases of malaria treated by him this year as compared to last. As in Tyler, the control of anopheles breeding was a simple problem compared with the elimination of the common house mosquito, and

here again the final elimination of the mosquitoes rests on the degree of co-operation received from the public of Lufkin.

The San Augustine County Lumber Co., at Keltys, a typical mill town, paid the entire cost of their anti-malaria work, while the railway on its part furnished the services of its Sanitary Engineer in the direction of the work. This Company produces from two to three million feet of lumber per month and, like most other lumber mills, has been working day and night to keep up with the demand for its product. Every request made on the mill in the way of furthering the malaria control work was immediately granted, for the management realized the importance of keeping its employees well. The labor situation was very acute. Wages were raised and every means taken to secure and to keep a full quota of men. The Army draft, volunteers, and the demand for labor in the picking of cotton and for work at cantonments produced a labor shortage never known before in east Texas. Mr. E. L. Kurth, Secretary and Treasurer, told the writer of this paper that if there had been the same amount of sickness this year in Keltys that obtained during 1916, the lumber mill would have been closed down probably one-half of the time.

Let us see what bearing malaria work in Keltys has to railway management. The San Augustine County Lumber Co. pays approximately $25,000 per month to the Cotton Belt Railway for the hauling of its freight, of which $15,000 is retained by the Cotton Belt, the balance of $10,000 going to connecting lines. On this basis during the months of greatest malaria infection namely, July, August, September and October, the St. Louis Southwestern Railway Co. received this year approximately $60,000 for the hauling of freight. According to Mr. Kurth, this might have been reduced to $30,000 had not excellent health conditions been maintained at Keltys. We can claim approximately $30,000 then in the Railway Company's receipts from handling of freight, which represents very clearly the definite connection between anti-malaria work and railway operation. In dollars and cents the income of the Cotton Belt has been increased by the profit on handling $30,000 freight. This profit will pay many times over the cost of anti-malaria work at Keltys. This example is typical to some extent of what has prevailed at the lumber mills in Lufkin and in Wildhurst. I quote from a letter from Mr. Kurth:

"For your information, we wish to advise that this community has been practically free from malaria since this work has been completed. Our roll of sick employees has been less than ever before, and consequently, with fewer men to draw from, we have been able to ship almost 20 % more lumber this year than ever before, due to the fact that the men we had were able to work regularly and were not out on account of sickness. There never has been a time when efficiency and maximum capacity has been so important to the country as a whole, and probably never will be again for the Southern pine operator. We have yet quite a good deal to do in this line, and assure you that with our first year's try-out, we are going to keep right in behind this matter and work harder next spring and summer than we have this year to make healthful living conditions among our employees."

It would be impossible in a paper of this character to give in detail the facts of accomplishments in all five of the cities and towns in which anti-malarial demonstrations were made during this season, but I append several tables that may be of interest to those who find it necessary to present statistics in order to convince those undertaking anti-malaria control of the efficiency and financial return from such work.

Practically all of the outfit cars used by extra-car gangs labor, work trains and section crews were screened early in the spring of 1917. No attempt was made to instruct either the foreman or laborers in the purpose of the screening. A study of hospital records and of time cards for the extra gangs working in Texas shows that during the months of May to October, inclusive, 1916, there was one laborer in the hospital with malaria for every 7,100 man hours of labor performed. For 1917 we find one malaria patient for every 11,100 man hours, representing a relative decrease of 36 % in the rate of malaria sickness among the Texas extra gangs. The B. & B. Department, from information at hand, employed approximately the same number of laborers this year as last, and during the corresponding months referred to above the hospital records show a decrease in the number of malaria patients from this department of 42 %.

PLANS FOR THE FUTURE

The necessity for maintaining a high rate of efficiency on all railroads during this national crisis convinces me of the prime necessity for giving every possible attention to the protection of health of railway employees. So far as anti-malaria work is concerned I present the possibility of more complete screening of outfit cars, extension of screening to stations, the furnishing of wire at cost for the screening of employees' homes, and the use of quinin in immunizing doses at all points where there are large numbers of employees who can not be protected through the elimination of malaria infection by destruction of mosquito carriers. I advocate the dissemination of literature on malaria giving instruction in means of avoiding infection to all employees and their families. I would also urge immunization of employees by local surgeons against typhoid and smallpox. The complete sanitary control and proper feeding of large extra gangs, work trains, etc., would be one of the very best means of protection of health of employees.

Anti-malaria work is past the experimental stage. At this time of war there is every reason why cities and towns, large and small business enterprises, and all public service corporations, should undertake to their fullest extent the elimination of the death- and disease-carrying malaria mosquito, and advance toward the goal of elimination of malaria from this hemisphere.

RECORD OF MALARIA CASES AT HOSPITAL FOR MONTHS OF JUNE, JULY, AUGUST AND SEPTEMBER, 1916 and 1917

	June		July		Aug.		Sept.		Total	
	1916	1917	1916	1917	1916	1917	1916	1917	1916	1917
Tyler	0	3	5	3	7	1	9	3	21	10
Texarkana	0	2	4	0	5	1	2	0	11	3
Pine Bluff	4	14	14	7	16	10	12	9	46	40
Illmo	0	3	5	3	4	3	6	3	15	12
Stuttgart	1	1	3	0	0	1	1	3	5	5
Broaddus	0	1	5	0	2	3	1	2	8	6
Camden	0	3	0	7	0	5	0	0	0	15

Note: Anti-malaria demonstration work was carried on in both Tyler and Texarkana. Camden figures for 1917 are large because of presence of extra gangs in this vicinity during 1917.

RECORD OF QUININ PRESCRIPTIONS SOLD BY C. & G. DRUG STORE, LUFKIN, TEX.

	Total No. Quinin Prescriptions		Total No. All Prescriptions		Ratio of Quinin to Total Prescriptions	
	1916	1917	1916	1917	1916	1917
Jan.	43	52	529	531	8.1	9.8
Feb.	37	31	453	379	8.2	8.2
March	30	27	425	310	7.1	8.7
April	30	21	416	233	7.2	9.0
May	37	20	381	212	9.7	9.5
June	61	33	463	241	13.2	13.7
July	98	20	791	159	12.4	12.6
Aug.	108	14	650	200	16.6	7.0
Sept.	91	15	515	173	17.7	8.7
Oct.	78	16	448	211	17.4	7.6
Nov.						
Dec.						
Totals						

Note: Anopheles breeding areas under control in July.

Total quinin prescriptions July 1 to Oct. 31, 1916 375

Total quinin prescriptions July 1 to Oct. 31, 1917 65

Decrease in number of quinin prescriptions 310

This decrease amounts to 82.6%.

RECORD OF QUININ PRESCRIPTIONS SOLD BY COKER DRUG CO., TYLER, TEX., DURING THE MONTHS MAY TO SEPTEMBER, 1916 AND 1917

	Quinin Prescriptions		Total Prescriptions		% Quinin Prescriptions to Total	
	1916	1917	1916	1917	1916	1917
May	25	14	186	165	13.5	8.5
June	20	9	166	70	12.0	12.9
July	42	15	205	160	20.5	9.4
Aug.	45	15	181	164	24.9	9.1
Sept.	17	13	145	115	11.7	11.3
Oct.	31	26	141	165	22.0	15.7
Totals	180	92	1024	839	17.6	10.9

Decrease in actual number of quinin prescriptions 1916 to 1917, 49 %.

Decrease in total number of all prescriptions 1916 to 1917, 18 %.

DISCUSSION

Dr. Albert E. Campbell, Health Officer, Illinois Central Railroad, Chicago, Ill.—I recall a little incident that caused Mr. Van Hovenberg to be employed by this Railroad. Dr. Evans had an article in the *Chicago Tribune* on "Malaria." It appeared in the morning paper just as I was

leaving the city. I read it and found that the prevention of malaria was not mentioned, and I wrote him a letter telling just what we were doing for the past three years, and it had reduced malaria among our men over 90 %. When twenty miles of our double track was washed away, we employed 4,000 men and we distributed 10,000 five-grain quinin capsules and the foreman of each gang was instructed to give his men two capsules Wednesday and two capsules Saturday. During the two weeks that these 4,000 men worked in this swampy, marshy section not a solitary case of malaria developed among our men, while the Western Union men working beside our men fell by the wayside and suffered severely. That was a complete demonstration of the value of quinin in preventing malaria among laboring men.

When I began this work over 50 % of our laborers were disabled by malaria. Often the section man and his whole family would be down with malaria. Dr. Evans (to my surprise) published the letter and it appeared in the *New York Evening Mail.* Mr. Gould, the Chairman of the Board of the Cotton Belt Railroad, read the article and his secretary wrote us asking for a full report of what we were doing, and this led to the appointment of Mr. Van Hovenberg as Sanitary Engineer for that Railroad. So much for what Dr. Evans is doing.

Twenty-five years ago I began practicing medicine in a small town in Logan County, Illinois. At that time malaria was prevalent everywhere in that section. I often prescribed two ounces of quinin a day. During the third year a public drainage canal went through that section and within three months I did not have many cases of malaria to treat. I had 25 ounces of quinin on hand. I sold 20 ounces and the balance lasted me over three months. From a financial standpoint drainage in that section was a bad thing for me and I am firmly convinced that drainage is an important factor in the control of malaria. Drainage has another value: it increases in a remarkable degree the value of the land. At that time improved farms were selling for $25 and $32 an acre. These same farms today are selling for $250 an acre. And one well-improved farm in this section sold for $310 an acre. The very swamp I often struggled through on horseback has since yielded over seventy bushels of corn to the acre.

Mr. J. A. LePrince, Sanitary Engineer, United States Public Health Service, Washington, D. C.—I was very glad to know that the railroads have taken such an interest in malaria, and are looking at the problem from a health standpoint as well as from a financial or economic point of view. After looking over the records at the Cotton Belt Railroad Hospital it appeared that the territory most affected, so far as malaria is concerned, or where they have had the severe type of cases, was in southeast Texas. We selected for our control operations a district that had the worst type of malaria. Mr. Van Hovenberg took over the work and has told you what the results are. We selected the worst place we could find along the line that passes through a malaria country. The influence of the work that is being done there is going to spread out into the surrounding country. The Cotton Belt Railroad has spent a great deal more money and has done more good public health work than people have any conception of at the present time.

I have seen mosquito control work elsewhere under other conditions, and I am going to depart from the subject a moment to touch upon one point that has not been brought out at this conference. I think it is generally accepted that all methods of malaria control should be used, but I am going to say that we do not know yet what all the methods of control are. We shall probably find some new or better ones than we now have. An important and practical method of control that should be applied in districts where it would be impossible to apply quinin or other measures, is to use the children of the country homes in the swamp districts to control malaria in the family where the parents can not be persuaded that malaria control is possible and economical.

I would like to stress a point that everybody should know. The malaria mosquito is absolutely different in habits from many other mosquitoes, and when it takes a meal of blood it remains close to where it took that meal of blood. It remains there for a long time until that meal is sufficiently digested so that it can fly off. We used that little fact on the Isthmus to keep our men with a low sick rate. The United States troops or marines there who did not apply that method, and were located in or near a swamp, had forty times as much malaria as we had where we had applied that method. We killed anopheles mosquitoes that were in the bedrooms. That was all that was done. To control malaria in a force of railroad laborers it cost us five cents a day. In the construction of the Panama Railroad we were absolutely surrounded by swamps and had to contend constantly with carriers of malaria. These emergency methods can and should be applied by our military forces if they have to go into districts which are known to have a high rate of malaria, say where we have over 30 % of the people sick with it. By properly instructing enlisted men for a few minutes much can be accomplished in the way of keeping soldiers fairly free from malaria under the worst conditions.

Dr. C. C. Bass, New Orleans, La.—I wish to call attention to the fact that drainage, when done for agricultural purposes alone, does not necessarily greatly affect the abundance of anopheles and the prevalence of malaria. The heaviest infection found up to the present time in Bolivar County, Mississippi, was in a community where drainage canals were put in several years ago. The banks of these canals have been allowed to become overgrown with vegetation and furnish an ideal breeding place for anopheles.

In another community through which several drainage canals had been dug several years ago, 56 % of the entire population were found to have malaria parasites in their blood. Drainage for the purpose of drainage only may, therefore, fail to greatly reduce malaria. If drainage canals are dug and maintained with the object of mosquito and malaria control in addition to the object of draining the land, I believe much more effect on the prevalence of malaria will follow.

Dr. W. F. Smith, Little Rock, Ark.—I am connected with the Hospital Department of the Missouri Pacific. A number of years ago we had 3,031 patients in the hospital during the fiscal year, and of this number quite a large proportion were infected with malaria and a relatively large number with typhoid fever. I went to the management and explained to them, from an economic standpoint, the loss of service they were getting on account of impairment in the energy of the employees who were infected with malaria and others that were coming down with typhoid fever. As a result of my explanation, instructions were issued that all camp and boarding cars should be screened, and where extra gangs were located more than a day or so in a place, temporary latrines be made and sprinkled with lime twice a week. The drinking water was boiled and a bulletin was issued to call attention to the anopheles mosquito. This was followed by a reduction of malaria in the hospital of 27.6 %, with a saving to the Railroad Company, it was estimated, of $10,000.

The Missouri Pacific has taken great interest in sanitation along its line. In connection with Dr. C. W. Garrison, State Health Officer, we visited several towns and instituted such measures as we saw fit, the Railroad Company bearing one-half of the expense and the town the other. I remember one town I went to had a bayou running through it. This bayou was thoroughly oiled and drippers were put in, and it was sprayed and a substantial reduction in the number of malaria patients resulted, although the town did not see fit to keep up the work later on.

I wish to say that as good an example as one can have of the efficiency of this kind of work is to be seen in Little Rock, Ark., right now. The United States Public Health Service, since the establishment of the cantonment there, has done such intensive work that a fly or mosquito is almost a thing of the past.

Dr. H. R. Carter, United States Public Health Service, Baltimore, Md.—In the first place, Mr. Van Hovenberg has not claimed so much as he had a right to claim. In making a comparison he took one entire year with another. As Dr. Bass has said, and as we all know pretty well, the cases in the earlier part of the year, to the middle or end of May, are practically all cases of malaria that are relapses from the previous year. Had Mr. Van Hovenberg begun from this time on, he would have gotten a better showing than he has made. He did not really claim for his work so much as he should have done.

This taking up of malaria control by the railroads is one of the biggest things that we have yet put across. I think within five years the Cotton Belt will have done twenty-five times as much. If we had the men now in the cantonments for next season we would have the Texas Pacific, the Mississippi Valley and Iron Mountain Railroads in the same work. It is the commencement of an enormous work in malaria control.

Mr. Van Hovenberg (closing).—I can only say to the railway management of other lines what I said today about Texarkana, namely, I believe it is a patriotic duty for the railways to undertake this work at this time. Since the flower of our manhood is leaving the cities in which they reside and are going to cantonments or to the firing line, I believe it is up to the railroads and municipalities to conserve the energies of those who live in these cities. It is necessary that those men who are not engaged in actual fighting be kept at the maximum of efficiency. This is the time for the railways to undertake this work. I believe this is the time when the cities and towns should undertake malaria control work, and not postpone it because of the War but undertake it because of the War.

GEOLOGIC SURVEYS AND THE ERADICATION OF MALARIA*

By Thomas Wayland Vaughan,
Geologist-in-Charge, Section of Coastal Plain Investigations, United States Geological Survey,
Washington, D. C.

INTRODUCTION

Two conclusions are now commonly considered established by students of malaria: (1) that the disease is caused by a parasite introduced into the blood of infected persons by a definite kind of mosquito; and (2) that the principal means of eradicating the disease is to eliminate the inoculating agents. Mr. F. L. Hoffman has made an excellent presentation of the general subject in his pamphlet, "A Plea and Plan for the Eradication of Malaria Throughout the Western Hemisphere," and indicates the great variety of organized, co-operating activities needed to achieve the elimination of the disease, which probably outranks all others in the human toll it takes, either as reduced vitality and efficiency or as life itself. I shall make no attempt to cover any field, except that of my own profession, geology.

There are three kinds of work bearing upon malaria eradication that are germane to geological surveys as organized and conducted in the United States. These are (1) topographic mapping; (2) areal geologic investigations and geologic mapping; and (3) investigations of water resources. In topographic and geologic mapping, the

---

*Read by title, Conference on Malaria (National Malaria Committee), Southern Medical Association, Eleventh Annual Meeting, Memphis, Tenn., Nov. 12-15, 1917.

Published by permission of the Director of the United States Geological Survey.

activities of geologic surveys naturally touch, or even somewhat overlap, those of drainage and soil surveys, and in some of the Southern states the state geologic surveys have under their jurisdiction both drainage projects and soil investigations, but other administrative arrangements are practicable. The three kinds of work mentioned are all concerned with supplying information on the breeding places of malaria-transmitting mosquitoes, and the third kind often leads directly to the elimination of possible breeding places.

Before separately discussing each of the three kinds of geologic work, in order to show the bearing of what has been and what should be done, a few brief general remarks will be made on the breeding places of anopheles. The genus finds most suitable temperature conditions in warm, temperate, subtropical and tropical climatic zones, such as in the southern United States; and the larvæ thrive within these zones, particularly where there is a plentiful supply of grass and algæ, in various kinds of large or small pools of relatively stagnant water, in ditches and streams in which the water is sluggish, and in swamps. The conditions best adapted for the life of anopheles are prevalent throughout a large part of the Coastal Plain of the United States, and it is in that physiographic province that the ravages of malaria are the greatest.

TOPOGRAPHIC MAPS

Mr. Hoffman appropriately says:

"These maps are of special value in that they indicate the stream margins, swamps, ponds, overflowed land, etc., which, broadly speaking, are the underlying topographic conditions chiefly responsible for the local frequency and relative intensity of malarial diseases."

Unfortunately the topographic mapping of the coastal plain part of the United States has lagged behind that of other areas, but during the past two years a great deal of work has been done in the states south of Maryland. The following table contributed by Mr. R. B. Marshall, Chief Geographer of the United States Geological Survey, gives, according to states, the number of maps of coastal plain areas already published or now being surveyed:

STATUS OF TOPOGRAPHIC MAPPING OF THE SOUTH ATLANTIC AND GULF COASTAL PLAIN OF THE UNITED STATES, OCTOBER 20, 1917

STATE	No. of Quadrangles Surveyed			Per Cent. of the Coastal Plain Surveyed Within the State
	15 min.	30 min.	Special and 7½ min.	
Virginia	21	4		80
North Carolina	21			22
South Carolina	19			24
Georgia	17			10
Florida	20			9
Alabama	2	3		3
Mississippi	6		8	4
Tennessee	1			2
Kentucky	0			0
Illinois	6			55
Missouri	0			0
Arkansas	3	6	1	13
Louisiana	35	1	7	20
Texas	11	11	47	10
Oklahoma		4		50

The surveys are far from complete, but there is a large body of available information which may serve as a basis for recognizing many places favorable for the breeding of anopheles and for organizing attacks on such places. In this connection the importance of the work of the drainage investigations of the Office of Public Roads and Rural Engineering of the Department of Agriculture, and that of many other public or private drainage surveys, should be mentioned, for they are among the potent factors in combating the malaria plague.

GEOLOGIC SURVEYS

Just ten years ago I was paid the compliment of being placed in charge of the Coastal Plain Investigations of the United States Geological Survey, and since that time geologic reports and maps prepared mostly in co-operation with the interested state survey have been prepared for the following states:

Virginia
North Carolina
South Carolina (unpublished)
Georgia
Alabama (parts of the State)
Florida
Arkansas (northeast)
Mississippi (unpublished)
Texas (northeast)
Texas (southeast)

Texas (west of Brazos River) (unpublished)

Geologic maps of Alabama, of western Tennessee, western Kentucky, southern Illinois, and of southern Arkansas and Louisiana were previously available, but all of these have been revised by the respective state surveys, by the United States Geological Survey, or in co-operation between the Federal and state surveys.

Most of the state maps are on a scale of 1 to 1,000,000, and although they show with as much accuracy as was practicable the surface outcrop of the geologic formations described in the text, they are really reconnoissance maps, and I earnestly hope that no great time will elapse before more detailed investigations may be inaugurated. The geologic maps are important in indicating the character of the rocks at and near the surface, and, in my opinion, should be studied in connection with both the topographic and soil maps in considering steps toward the suppression of malaria, for the chemical and mineral composition, the physical condition, and the attitude and geologic structure of the rocks are among the factors that control the surface configuration of the land and the character of the soils. As an illustration of these principles, it will be said that where the land surfaces are relatively flat and are of appreciable height above the drainage channels, if the underlying geologic formations are porous, rain water will sink into the earth and will not tend to accumulate in ponds and swamps; but, if the formation underlying the surface is compact, a stiff clay, for instance, much of the rain water will remain on the surface until it disappears by evaporation. Geologic maps take into consideration a greater depth of rock below the surface than the soil maps.

WATER SUPPLY

That problems of water supply touch the public health in many ways is clearly recognized by those who concern themselves with sanitation, and it is generally known that polluted domestic waters cause epidemics of typhoid fever, dysentery, and other intestinal diseases. There has rightly been a nation-wide campaign to instruct the public regarding certain precautions and to apprise it of the penalty it will pay for carelessness as regards water. Although all to be desired has not been accomplished, there has been a wholesome response to the propaganda dealing with this subject.

There are two kinds of domestic water-supply that may become breeding places for malarial mosquitoes. One of these is impounded water, either in cistern or pond; and the other is the shallow, open well. Both of these methods of procuring water should be discouraged, if there is any other available source of supply; and, if there is no other practicable means of obtaining it, certain stringent precautions that are known to this audience are absolutely essential. Wherever possible, water supplies for domestic purposes should be obtained from deep wells, usually artesian wells which may be characterized as wells that derive their water from a pervious stratum overlain by an impervious stratum, at a level sufficiently below that of the surface outcrop of the pervious stratum for the water to rise in the well because of hydrostatic pressure. Such water is naturally filtered and free from microbic contamination; and mosquitoes can not breed in it, at least not until it flows, or otherwise returns, to the surface of the earth. Drilled wells from which the water is pumped, although they may not be artesian, afford no breeding places for mosquitoes.

In this connection an experience of Dr. L. O. Howard is appropriate. He told me that, shortly after Sir Donald Ross had proved the transmission of the malarial parasite by mosquitoes, he delivered a lecture on the subject in Texas. In the discussion that followed, a local physician opposed the mosquito theory and defended the explanation that the disease is spread by miasmatic emanations and polluted drinking water, and stated in support of his contention that wherever the domestic water supply comes from artesian wells there is no malaria. This physician did not recognize that if water from artesian wells is not allowed to flow out and form pools or puddles the use of water from such a source completely removes any possibility of domestic water-supply furnishing breeding places for mosquitoes, and thereby is an effective factor in eliminating malaria.

The use of artesian water only eliminates domestic water-supply as a source of the propagation of malaria, provided,

of course, that the water that may overflow from the well is not permitted to accumulate in pools and puddles. As many wells are allowed to flow, precautions should be taken to care for the discharge and not allow it to stand on the surface of the ground. At least most wells should be cut off while water is not being drawn for useful purposes. The most important source of probable damage in an artesian well in which the flow is artificially stopped is that the pressure of the water may cause leaks in a weak or otherwise defective casing.

Unfortunately the information on the eradication of malaria in places where the water-supply is from artesian wells is qualitative, not quantitative, but the disappearance or reduction of malaria in communities where artesian water is used is striking, and the result is what is to be expected.

Papers on the ground-waters of the Coastal Plain have been prepared for all the states for which there are the geologic reports previously mentioned. The two lists would be the same. The public demand for these ground-water reports is great. For instance, the edition of the one on Florida, United States Geological Survey Water Supply, paper 319, was exhausted only a few months after it was issued. In accumulating and distributing information on ground-water and on other domestic and municipal supplies, it is my belief that the Federal Geological Survey and the various state geological surveys are rendering a public service of great value, and that a part of this value consists in eliminating the cause of malarial infection.

OUR MALARIA CAMPAIGN*

By W. C. Johnson,
President, Chamber of Commerce,
Memphis, Tenn.

It is a great pleasure to be able to address a sympathetic audience on the subject of malaria. I have had occasion to address many unsympathetic audiences in the last six months. The position which I occupy at present, as President of the Chamber of Commerce of Memphis, has given me an opportunity to carry out a cherished plan and ambition I have entertained for many years, and that was to bring about in Memphis a thorough-going, scientific campaign against malaria.

The first difficulty we found was really to convince our people and, much to my surprise, it was just as necessary to convince our doctors as it was our laymen that we had any malaria in Memphis. We were told that it was not only a fact that we had malaria here, but it was practically treason to talk about it; that we ought not to say a word about it, and that attitude persisted to such an extent that when we began attempting to secure cantonments and aviation fields and other things, the same argument, the same statement was made, and we were not permitted, those of us on this committee who believed that we had malaria conditions here that ought to be remedied, to admit that we had malaria here; that if we had, we were not to talk about it. But as time went on we secured the hearty co-operation of our City Board of Health and County Board of Health for a genuine anti-malaria campaign. That campaign took the form of the drainage of our pools and ditches in the City and County, at least in the populous portions of the County contiguous to the City, and the application of oil by means of spraying and by means of cans. I do not want to go into details with regard to this campaign, as that would weary you, particularly some of you who are not experts, and it probably would be a redundancy to those who are experts, but I want to dwell largely upon the problems we were confronted with in connection with this measure.

One of the first problems was this: we were told that the expense of carrying this campaign into the County and contiguous territory would be absolutely prohibitive; that the cost of draining our ditches and pools and laying out streams to make this work effective would run up to $150,000 or $200,000. We found this to be greatly exaggerated. I do not know how it appeals to you gentlemen of the profession, but to me it seems absolutely useless to try to prevent malaria in Memphis and Shelby County or the territory contiguous to it unless we do it through mosquito control.

*Address before Conference on Malaria (National Malaria Committee), Southern Medical Association, Eleventh Annual Meeting, Memphis, Tenn., Nov. 12-15, 1917.

Now, we have had put up to us the proposition that if quinin does control it, and it does in certain sections of Mississippi where it has been tried, it is useless for us to go to the expense of draining the ditches and bogs and stagnant pools. All that is necessary is to give people quinin. That proposition you ought to settle definitely here. I do not believe we are going to help our situation much if we are simply going to rely upon quinin; we are not going to eliminate the mosquito stings and bites, which are the carriers of malaria. A great many of our people tell us that is one of the great mistakes of our campaign; that we will not get rid of stagnant pools and ponds which make for disease and unhealthy conditions, whereas in the elimination of these stagnant pools and ponds and bogs we get better health conditions as to malaria and typhoid fever as well. We have secured these conditions in the City of Memphis and our health records will show it. You will not succeed in making people take quinin regularly year in and year out and control malaria in that way. It is not practical in a large city like Memphis, so I earnestly hope you will go on record as absolutely and definitely advocating mosquito control as the only safe, sane and practical way of eliminating malaria.

Another one of our difficulties is this: our people in the country adjacent to Memphis are accustomed to having their pools or ponds for watering their stock. They simply dig a hollow there and embankment here and convert it into a pond and succeed in keeping it supplied with water which is sufficient to water their stock; yet at the same time these ponds are ideal breeding places for the anopheles. Those conditions prevail all over West Tennessee, and I presume they do throughout Mississippi as well, and they do not want to part with these stock ponds. I know of one instance where five or six cattle died suddenly, and they claimed it was due to the cattle drinking the oil on the pools. It will not kill the stock, but these people are absolutely sure that their cows have been killed by drinking this kerosone on the surface of the water. They have brought suit to establish a claim of that kind; but they stick to these water places for their stock and it is impossible to convince them that it is necessary to drain them.

The next problem is how to induce or force the people to drain the stagnant pools and ponds within the city limits and within the confines of the County. I say forcing, because I believe it ought to be done. I do not think any man has a right to maintain an insanitary nuisance on his premises; that the city or county authorities have a right, and should enforce that right, to make that man drain his pond or his pool if it is insanitary and a breeding place for mosquitoes. Now, that seems to be a simple matter, but it is more difficult than it seems. The president of your board of health has to be re-elected; he does not want to make enemies. It is difficult to go and say to a man "I insist or demand, or I will prosecute you, if you do not fill up this pond or this pool." There is no other way to have it done. If the county and city have to pay for the expense, it would be unnecessary and a terrible burden, and we ought not to face such an expense. It should be the individual land owner who should pay that expense. We are, as I have said before, confronted by this proposition, and that is in the line of the difficulties we have to contend with.

I have become interested in the problem since we began the work for this primary reason, that as President of the Chamber of Commerce we have been interested in trying to secure cantonments and encampments for soldiers in Memphis. We have been interested in trying to secure aviation fields, and that brings with it the problem of protecting the soldiers. I have realized, as I think some of our Sanitation Committee have from the beginning, that we must improve our malaria conditions; we must make any camp or cantonment, or aviation field, absolutely immune to malaria if we are going to have the city safe and keep our soldiers in a fit condition to fight. Working along these lines, we have seen the absolute necessity of malaria campaigns and malaria work in a way that we have never seen before and we have a presentation now we never had before. It makes possible for us to have Government assistance, and it makes it possible for us to have sympathy and enlightenment on this subject which we have

never had before. I have talked on this malaria and mosquito proposition in season and out of season in Memphis, and we have brought about the first real, thorough-going, scientific campaign against malaria, and I think some of our people have been restless about my talking to them. It has been amusing, because in the last few weeks the sanitary officer at the aviation camp has come down with chills and fever and has been everlastingly insistent in asking me to do all I possibly could with regard to the malaria proposition.

As I have said, he has been most insistent about the matter, and I think that fact alone has greatly aided us in arousing public sentiment.

We have got to have an enlightened public sentiment on the question of malaria extermination. We have, through the Metropolitan Life Insurance Co., spread 28,000 pamphlets through Memphis territory alone. But that is only a beginning. You men who are interested in the malaria proposition, who know its dangers, and know the handicap under which the South labors in this matter, must enter a campaign of enlightenment and education of our people. You have got to talk about it and keep at it incessantly in season and out of season.

Just a word or two in regard to the matter of land values in connection with this. The other side of our problem is that it is a tremendous advantage from a financial standpoint for Memphis and Memphis territory to undertake in a practical and permanent way the extermination of malaria. I heard the statement made tonight that a number of people have been brought to certain parts of Mississippi for the purpose of inducing them to take up their homes and enter upon agricultural pursuits, but these people, after a short sojourn, went back home because they were afraid of having chills and fever. We have had to turn away a great many men who were not acclimated nor accustomed to our chills and fever. We are handicapped, and we always will be, in making the progress that we should make until we can exterminate chills and fever. If we can exterminate malaria, it will not only result in bringing new life and additional population to our Southern cities, but in an enormous increase in the value of our land. The money that we will spend on malaria control and the extermination of mosquitoes by draining ponds and pools and making the territory safe and sound will give back to us ten times over the amount of money we expend, and our farms, instead of being worth $30.00, $50.00 or $100.00 per acre, will compare with the highest priced lands in the world, such as Illinois, where farms are said to be worth $350.00 to $500.00 per acre. In other words, it is a splendid financial undertaking and a magnificent investment from every point of view. We should bring that home to the people. If we point out to them that malaria is a menace to the health and life of the children in our schools, who are handicapped for nine months in the year, sometimes handicapped for life in getting their education, they will see this advantage as well as the dollars and cents in the appreciation of land values.

I hope that this convention will result in great good to the South. I hope that the United States Public Health Service will give us an officer who will remain in Memphis and Shelby Count until we make such a practical demonstration of malaria control that every county contiguous to Memphis, and every man in the whole Memphis territory, will see that he is meeting success with this practical plan, and they will endeavor to emulate what we have done here, and that the results will not only be local but will be universal, extending over the whole Southern territory.

MEMPHIS' MALARIA PROBLEM*

BY BOLTON SMITH,
Chairman, Sanitation Committee, Chamber of Commerce,
Memphis, Tenn.

The work of the Committee has consisted to a very large extent in supporting the activities of the President of the Chamber of Commerce, Mr. W. C. Johnson, who from the beginning of his administration has been very much inter-

*Address before Conference on Malaria (National Malaria Committee), Southern Medical Association, Eleventh Annual Meeting, Memphis, Tenn., Nov. 12-15, 1917.

ested in the elimination of malaria. The success of the work done in and near Memphis last summer warrants us in believing that if Dr. Kerr will send us one of his first-class men, as he intimates he hopes to do, we will be able substantially to eliminate malaria not only from Memphis, but from the Aviation Camp at Millington. The City and County have both made considerable appropriations for this work and all that is necessary is competent and experienced direction.

Because of the millions of men in the flower of life who have either been killed or so wounded as to be incapacitated for productive labor, the burden on the rest of us, even after the War is over, will be far greater than ever before if we are to hold high the torch of civilization and be true to the ideals and achievements of the race. New shoulders will come to bear this burden in other generations, but in the meantime how shall the present generation be equal to it? This can be done only by such a general improvement in the health of the community as will enable us fully to utilize all of our faculties all of the time.

The elimination of malaria from the South would probably add 25 % to the effective activity of the people, not because we are ill that much of the time, but because of the influence of such illness long after we have gotten well. The experts say this end can be achieved. Drs. Andrews and Graves, respectively Presidents of the County Board of Health and of the City Board of Health are both here to join in our request that the United States Public Health authorities send a man here to help us out.

DISCUSSION

Addresses of Mr. W. C. Johnson and Mr. Bolton Smith.

Dr. Thomas Clark Graves, Memphis, Tenn.—I am in full sympathy with everything that Mr. Johnson and Mr. Smith have said, and we have done everything that our finances would permit. I think we had the sum of $3,000 this year to commence with about the 20th of June, and we could only take in a small territory adjacent to the City of Memphis. As Mr. Johnson has said, our Health Officer at the Camp is anxious to eliminate malaria, and I am only too glad to extend an invitation to a representative of the United States Public Health Service to come and help us in our effort in draining and oiling in order to eliminate malaria from this district entirely.

Dr. John W. Kerr, United States Public Health Service, Washington, D. C.—For several years I have been stationed at the Bureau at Washington, with executive duties to perform. My relation to the malaria problem has heretofore been a very direct one and I have had a real interest in it.

Three years ago we appeared before one of the committees of Congress and asked for an appropriation of $250,000 with which to carry on the work of prevention of malaria and typhoid fever. We were granted the courtesy of a hearing, a very searching one, but the question at once arose as to why the Federal Government should indulge in these activities within the states. We did not then get the appropriation. There is evidence today before this Country, and before the South especially, why we should have had it. If we had, we would have been further advanced in our preventive work and the places that have been looking forward to the location of cantonments and Army reservations in their midst would have been perhaps in a better position to press their claims. Since the War developed, I have felt that the greatest work the Federal, state and local health authorities had ever been confronted with was presented to them for solution; that not only was it necessary to guard the health of the soldiers, but it was necessary also to care for the civilian population, and the work, as I see it, must be developed along various lines. One of these lines already followed has been the control of malaria. The fact that not only state and local health authorities, but commercial bodies and civic organizations, such as the Cotton Belt Railroad and chambers of commerce, recognize this need, is one of the best signs of the times.

I had not expected to speak again, but I could not forego the pleasure of expressing my appreciation of the remarks of the President of the Chamber of Commerce of Memphis, and I wish to assure him that the United States Public Health Service will detail an officer to come to Memphis and advise in respect to malaria and try with the aid of the State and local authorities to begin organized anti-malaria work in this community.

Mr. Johnson (closing).—There is only one thought that I have in connection with what has been said, and that is, if we have a United States Public Health officer in Memphis to assist us in this work, it will give a direction to it that we could not otherwise secure. It will give us, of course, the value of his experience and the practical direction necessary to carry out this work in a successful way. It will also give us the supervision and inspiration that is absolutely necessary to make of this thing a success. That is my opinion about it, and Memphis has had such a reputation for fevers and for malaria that it will certainly be worth while for the United States Public Health Service to take hold of this situation right here, and the example afforded by a successful anti-malaria campaign will certainly prove an inspiration to the whole South.

WHAT THE COTTON BELT RAILWAY COMPANY IS DOING FOR THE PREVENTION OF MALARIA*

By H. H. Smiley, M.D.,
Texarkana, Ark.

Anti-malaria work is predicated upon the assumption that malaria can be prevented and that its prevention is worth while. Both of these assumptions are now well-nigh axiomatic. For proof of the former, one has but to consider the results obtained in Cuba and Panama.

The first anti-malaria work done by the United States was begun in 1901. General Gorgas and his assistants reduced the annual death rate in Havana from as high as seventy-eight to the thousand of population in former years to only one to the hundred thousand in 1914. You are familiar with the fact that only by the eradication of malaria and yellow fever was the building of the Panama Canal made possible. For proof of the second assumption, one need only contemplate the vast economic loss to the Southland through the ravages of this disease. Careful investigation by the United States Public Health Service leads Dr. H. R. Carter to remark that in localities where malaria is prevalent it does more injury than all other diseases combined.

The Cotton Belt Railway Co.'s campaign against malaria was begun in 1916. Mr. Edwin Gould, Chairman of the Board of Directors, became interested in the matter when his attention was directed to the large number of employees treated for malaria at the Company's Hospital during each year. But the Hospital funds, secured by monthly deductions from the salaries of employees, were not sufficient to finance this new departure. Then Mr. Gould from his private fortune set aside a fund the proceeds from which are to be used in this great work.

In the beginning the aid of the United States Public Health Service was solicited and it was most freely given. The resources of the whole anti-malaria division were placed at our disposal.

In January, 1917, Mr. J. A. LePrince, who for fourteen years had charge of the field work in the Canal Zone, and Dr. T. H. Griffitts, both in the Government service, made a quick survey of our lines and their report recommended that thorough prevention work be undertaken at two or three points with the object of eradicating the breeding places of the malaria-carrying mosquito. In addition they recommended prevention work in general along the line by the proper screening of sleeping and working quarters, the prophylactic use of quinin and a campaign of education.

To direct this work it was determined to employ a capable and experienced sanitary engineer.

In the meantime control work was begun during May, 1917, in the city of Tyler, Tex., under the personal direction of Mr. LePrince and Dr. L. L. Williams, also of the Public Health Service.

On the first of July, 1917, Mr. H. W. Van Hovenberg, formerly City Sanitarian for the City of Dallas, Tex., was appointed Sanitary Engineer, and since that time he has devoted his entire time to anti-malaria work. In addition to Tyler, he has placed the towns of Lufkin, Wildhurst, Keltys and Texarkana under control.

It is needless for me to tell you that control work contemplates eradicating the breeding places of the anopheles mosquito. This is accomplished by first making a mosquito survey of a given town. Then it is determined how control work can best be done in the cheapest way. Small streams are properly ditched. This is done by clearing the banks of weeds and debris and so narrowing the channel that a free current is obtained and stagnant pools eliminated. The banks of larger water courses are also properly cleared of weeds and brush. Ponds and water reservoirs are likewise treated so that no shelters are left in which the female anopheles may deposit her eggs. In still waters the propagation of top-feeding minnows is encouraged because they are the natural enemy of the mosquito. Where all of these means are not yet sufficient to prevent mosquito breeding or where the cost of any of these methods is prohibitive the surface of the water is oiled each week

*Read before Southern States Association of Railway Surgeons, Auxiliary of Southern Medical Association, Memphis, Tenn., Nov. 12, 1917.

by the use of a knapsack sprayer which sends out a fine spray of crude oil or a mixture of crude oil and kerosene.

Each town entered must bear a part of the expense of this work. This is required for three reasons: first, because by so doing a greater number of communities can be benefited by the funds provided; second, because the citizenship in general is benefited as much as the railway employees; and third, because municipal cooperation assures passage of any necessary ordinance and continued interest in maintaining the work from year to year. And this assistance is readily obtained. When one town learns of the good work accomplished in a neighboring town it naturally seeks information concerning the plan by which that result was brought about. Mr. Van Hovenberg confers with the city council, the mayor or the city health officer. If it is decided that the work can be undertaken at that time, laborers are put to work under the direction of a competent field man.

On account of the necessity for frequent inspection only a limited number of towns can be placed under control during one season. The season for work of this sort begins in the early spring and ends in the late fall. The towns, when placed under control, are required to employ one or more men to continue the spraying and do such other work as is needed to maintain control.

In addition to the work outlined above all cars used for boarding employees have been screened with sixteen-mesh wire.

The results thus far obtained are indeed encouraging. The total cost of the work during last summer at Lufkin, Tex., a city of about 3,000, was $850. The City Health Officer stated during the late summer that he had little or no practice at that time when he ordinarily would have been busiest. The Company Physician of the lumber mill there stated that he had noted a decrease of 80 to 85 % in the number of malaria cases this summer compared with last year. Two doctors were kept busy at the mill last year, while this year only one was employed and he was not overworked. Four drug stores showed a decrease of 68.5 % in the total number of prescriptions sold during August, 1917, as compared with those sold during August, 1916. One of the leading drug stores showed a decrease of 82.6 % in its sales of quinin prescriptions from July 1, 1917, to October 31, 1917, as compared with the same period in 1916. And the doctors in Lufkin give every possible assistance to the work.

For this winter Mr. Van Hovenberg has planned educational work which includes an exhibit car, moving pictures and the sending out of circulars which tell in simple language how malaria is contracted and how it can be prevented.

The ultimate goal for which we are striving is employees of one hundred per cent. efficiency in so far as their efficiency is now lowered by this preventable disease. As this goal is approached the resistance of employees against other diseases will be correspondingly increased.

While the Cotton Belt is the first railroad to undertake elimination of malaria by eradicating the very cause of the disease, Dr. A. E. Campbell, Health Officer of the Illinois Central, has obtained good results by distributing quinin among his employees in malarial districts.

At this crisis in our National history, when conservation is the keynote of service, we invite you to join us in assisting the Public Health Service wipe out this great scourge to the Southern states. You are all doing your best to uphold the Government. Some of you are giving your boys to the service. Some of you are giving your daughters to the service. And some of you are going yourselves. I do not need to appeal to your patriotism. I do not need to appeal to your spirit of self-sacrifice because the doctors are more self-sacrificing than the members of any other profession. But let me ask you to continue your self-sacrificing devotion to the profession by spreading still further the gospel of prevention. Impress upon your patients and upon your acquaintances in all walks of life the fact that malaria can be prevented, and when a majority of the people in any town or city in a malarial district are convinced of that fact they will demand that the city authorities give them that protection to which they are entitled.

MEDICINE

CHRONIC ACIDOSIS: ETIOLOGY, PROPHYLAXIS AND TREATMENT*

By George C. Mizell, M.D.,
Atlanta, Ga.

The present paper is part of a long study of a protean type of cases that appears to fall in the same class. Its purpose is to call attention to certain facts concerning chronic acidosis, and its relations to the skin, and to suggest some agencies in treatment which have proven useful.

Let me illustrate by quoting from the records the salient features of a class of cases that are manifestly suffering from chronic acid intoxication.

Age and Sex.—Usually they are adult females of the child-bearing period, but males and females of all ages are affected.

Past History.—More often than not the patients give a history of some severe illness from which they date the onset of chronic ill health. Some still suffer from a sequel of the previous illness. Health is better in the winter than in the summer.

Present History.—The appetite is variable. There may be a burning feeling of tongue, in the esophagus, stomach and bowels. There may be constipation, diarrhea or alternate constipation and diarrhea, and vomiting may accompany the diarrhea. The patient may be confined to bed on account of weakness, but he is more often able to attend to business, with difficulty. All complain of being easily fatigued and have palpitation and shortness of breath on moderate or even slight exertion. Also these symptoms are frequently present after meals.

Some complain of burning of the feet and hands and some of aching or sharp pains in the extremities.

The eyes are stated by the patient to be weak and are usually sensitive to daylight. They all complain of nervousness, some of headache. Several of the above symptoms have been present for two or more years, but they state that a more or less marked remission occurs in the winter.

Inspection reveals a constant symptom, viz., a dry skin which may be rough. The patient, if an adult, looks older than his age. He has perspired little or none at all in some years. He usually looks depressed.

On examination we find the pulse of the majority above 80, often 90 to 100, or more. Temperature in summer is around 99.5° F. Respiration may be increased or diminished. The abdomen may be tender, especially over the sigmoid. In some the ankles are edematous and often the kneejerk is exaggerated.

The laboratory findings of the feces are not significant. The urine is usually negative except that the specific gravity is almost always constantly low and indican is often abundant.

The gastric analysis commonly shows anacidity, and while the acidity is usually low, it may be high.

The pyrosis occurs as often in those that have anacidity as in those that have hydrochloric acid.

The stomach is usually hypomotile. Abnormal quantities of mucus in the lavage is the rule.

The hydrogen-ion concentration (serum) was taken in ten of such cases, and with one exception it was increased. The increase was not marked, the highest pH. being 7.45, the lowest pH. 7.6. In two of the cases acetone and diacetic acid were present.

(These examinations were made in my laboratory by Dr. Gerald Selby, whose work was terminated by his entrance in the Regular Naval Medical Service. We hope to resume the investigation and later present more acceptable laboratory information which at present is far from complete.)

There are three points that should stand out in the histories, viz.: the condition of the skin; the weakness or fatigue on exertion; and the increased hydrogen-ion concentration.

In regard to the case that showed a pH. of 7.6, which is the lowest normal given in the series of Levy, Rountree and Marriott (Int. Med., September, 1915), reexamination could not be obtained. We think she would have shown an increased

*Read before Southern Gastro-Enterological Association, Memphis, Tenn., Nov. 12, 1917.

pH. at other times, as it could have been lowered at this particular time by alkalies or diet.

Since none of the recognized causes of acidosis are to be found in these patients, and since it is always secondary or a symptom of some other condition, and as from the histories it appears that an acidosis has existed for several years, the question is what is the primary cause that is keeping it up. An analysis of the contributions on the causes of acidosis agree that it takes place in three ways, due to several causes:

1. By a decrease in the bases—the acid radicles remaining the same as in the absence of food or a loss of food by vomiting and diarrhea;
2. By an increase in the acids, the bases remaining the same as when the carbohydrates are deficient in the food to less than 10 %, and in the absence of protein;
3. By a retention of acids as in nephritis.

We classify the above-described cases as "chronic acid intoxication," due to retention, and in this connection call attention to the avenues of elimination of acids.

The volatile acids are eliminated by the lungs and the soluble non-volatile acids of the lower group are eliminated by the kidneys.

There are acids of the higher group passing through the body which are constantly, even in health, being eliminated through the skin, which is the only organ designed to eliminate them.

Thomas Lewis ("Lectures on the Heart," Paul B. Hoeber, New York, 1915, p. 91) records cases in which the acids have not been identified, and the question of an acidosis due to acids that can not be eliminated by the kidneys and lungs is an open one.

The task of identifying the acids falls to the chemist, but we may aid him by suggesting the field of his investigation.

The most fertile source of acids in the body are the fatty acids and our physiologic chemists, after going far afield, are finally concluding that the acids of diabetic acidosis and starvation are derived from them. They now tell us that in starvation these same acids are present, and that they are due to the inability of the organism completely to oxidize them.

In simple starvation no pathology exists in the tissues. Hence, the assumption that fatty acids can not be completely oxidized except in the presence of carbohydrates does not convey the correct impression. It is much easier to think that the failure in complete oxidation is a necessary act on the part of the cell. A good reason for this becomes evident when the conditions existing in starvation at the seat of all physiological action are examined.

In starvation the tissue cells are furnished neutral fat for fuel. Neutral fat is split into glycerine and fatty acids. Glycerine is easily oxidized, leaving behind a large molecule of fatty acid, which in the process of metabolism is split into a number of small molecules, each having as great an acid reaction as the parent molecule. At each step the acid contents of the cell rises in geometrical proportion, and if the oxidation and reduction process continue, the cellular contents would become acid in reaction.

Protein is utilized and furnishes ammonia for neutralization, but protein utilization is limited and must be conserved. Some carbohydrate is derived from the protein, but the heavy fatty acid molecule is not yet oxidized to water and carbon dioxid.

Further splitting will endanger the cell, so the necessary act is to throw the several small fatty acid molecules, soluble and insoluble, volatile and non-volatile, into the waste channels to be eliminated. By thus throwing out the small molecules of incompletely oxidized fatty acids, with their high acid reaction, room is made for another molecule of neutral fat with its valuable glycerine.

The soluble fatty acids appear in the blood stream which carries the volatile ones to the lungs and non-volatile to the kidneys. The higher fatty acids can escape through the skin only. It is well known that some of the fatty acids of the ingested food appear along with the other fatty acids, in the excretions of the skin. This shows that these acids are eliminated as waste products. Furthermore, the importance of the skin, especially in disease, as an eliminative organ has long been given an important place. However, the significance of the acid contents of sweat

and sebum in this connection has not been brought out, nor has the potency of the acids of the higher group heretofore been given a place in the chemistry of acidosis.

PROPHYLAXIS AND TREATMENT

The management of these cases was undertaken from this viewpoint, and some of the observations that were made from time to time during the evolution of the treatment are interesting. For example, we reasoned that the acidosis called for alkalies, which, when given, had to be abandoned because the alkaline treatment was accompanied by glossitis and gingivitis. Again, in the indicanuria cases a carbohydrate or lacto-farinaceous diet produced gingivitis or glossitis in about a week. A very important observation was that the sore mouth was relieved by instituting an animal-protein diet. The vegetable proteins did not relieve this symptom.

Next, it was noted that the administration of dilute hydrochloric acid given to an anacidity patient was accompanied by polyuria.

These facts have a significant meaning when considered in connection with a chemical intoxication.

Passing over the agents of generally-known value in preventing and treating acid intoxication, I shall relate only those ideas which have been developed in the personal study of my cases.

Of great importance is rest in bed and frequent bathing with alcohol and water. Since it has been shown that there is acid intoxication in most wasting diseases, bathing assumes new importance, especially since urea elimination by the skin is now considered negligible. Massage is beneficial in chronic acid intoxication. A hard, dry skin with sweat glands closed and sebaceous glands plugged with comedones does not perform the function which no other organ can compensate.

Acid intoxication accompanied by vomiting and diarrhea is of especial interest to the gastro-enterologist.

With the known, if incomplete, chemical pathology it is easy to construct a diet. Farinaceous and albuminous foods meet the indication, and it is important to select the carbohydrates that do not easily ferment.

In the presence of vomiting, solid food (crackers and steak) properly chewed and swallowed every two hours, preceded by soda bicarbonate, a drachm in water (four ounces) acts like a specific. Perhaps it is not going too far to state that they are specific for nausea and vomiting, as they do not fail to relieve nausea and vomiting, whatever the cause, unless there is obstruction.

DISCUSSION

Dr. Allan Eustis, New Orleans, La.—I believe these cases of mild acidosis are far more common than most of us realize, and yet I think that "acidosis"—mere acidosis—is not a diagnosis, not any more than tachycardia or remittent fever. A number of years ago I attempted to differentiate between an endogenous acidosis and an exogenous type, due to faulty diet. Dr. Mizell's case presents certain typical symptoms of myxedema and I have seen many similar cases, and it is perfectly wonderful how they improve under thyroid extract. Dr. Mizell has said where there is interference with oxidation there will be increase in acids, and it is very easy to understand, therefore, the tendency to acidosis in deficiency of thyroid secretion. But in those cases that come with a dry skin, with slight edema of the feet or perhaps some swelling of the hands—perhaps the patient can not put on a ring—with weakness on exertion, out of all proportion to the slight muscular exercise—it is very remarkable how they will improve under thyroid extract. I believe we will have to look further into these mild cases of acidosis and determine whether the intestinal canal, or some interference with the endocrinous glands, is the causative factor.

Dr. Anthony Bassler, New York, N. Y.—I would like to make a suggestion, if I may, that you work along the line of feces examination of slides in acidosis cases—make a Gram differential stain and observe the fact that they are largely Gram-positive pictures. I think that acidosis may be looked upon today, with as much as we know about it, as due to a disturbance in the small intestine, in which the use of high protein diet would change the bacteriology in desirable ways and will leave the patient free as to the factor of acidosis.

Just one case. A woman, middle aged, had convulsions at intervals of about six in two weeks. She would be free for two or three days. She would be up and about and have one fairly good day. Then along would come another convulsion. This condition had lasted three years and she had seen one doctor after another without any suggestions worth while. A study of the alveolar air and a study of the blood showed that she had distinct acidosis and what was interesting in her case was that in addition there was a low epinephritic content of the blood. She was put on a Salisbury diet, and by means of a Jutte tube had transduodenal lavage three times a week. She went six weeks without an attack. She then for some reason began to have attacks

of somnolence, and although we felt well satisfied in general with the intestinal condition, apparently she was again becoming acid. We again went over the alveolar air, blood and stools, and we found that while she still had acidosis, it was very much diminished. At that point the use of the suprarenal extracts was employed and the use of Dr. Rogers' suprarenal extracts of the aqueous extracts of the residue. We discontinued the lavage and enlarged the diet somewhat, giving her more fats, and now after about one and a half years the woman is entirely well. I just mention that case to you for the suggestions that may come in the treatment. I can not arrive at any more definite conclusions than these.

Dr. M. L. Graves, Galveston, Tex.—We are indebted to Dr. Mizell for calling our attention to the possibility of acidosis, so-called, being a chronic condition and producing perhaps in itself a clinical-complex of which we ought to take more particular notice. But from the information set forth in his paper it seems to me the difficulty is in asserting that the cases with the clinical-complex that he presented are cases due to so-called acidosis. These might be due, as Dr. Eustis has said, to myxedema, although if I understood him it was an actual edema and not a mucoid collection in the subcutaneous tissue. If that be true, it is necessary to eliminate myxedema as a cause. But I do think there are a number of other things, as, for instance, cardiorenal disease, the primary renal disease connected with interstitial nephritis, advanced cases of cardiac degeneration, certain cases of advanced anemia, that are very similar to these cases of so-called acidosis. It appears to me impossible to say that the hydrogen-ion concentration of the blood is not itself one of the symptoms similar to his dry skin and other clinical symptoms presented, and that they are all due to some other cause. In other words, the acidosis itself is much more complex than we are now inclined to believe. As a matter of fact, I am disposed to agree with the point of view of Sellards, of Boston, in a very fine little book on "The Principles of Acidosis" that he has recently published, in which he calls attention to the fact that acidosis itself is a misnomer, that it is really not acidosis with which we are dealing, but alkali-starvation, a diminished alkaline content both of the blood and tissues of the body; and that while some of these acids are present in large quantities, it results in a diminution of the normal alkalinity of the fluids of the body. So it seems to me that we have no actual explanation of the condition itself. This is further shown from the fact that in cases of uremic coma in which you have acidosis in a marked degree, the administration of alkali by intravenous injection or by other method is wholly inadequate to relieve the condition. The administration of alkali in the early stages is wholly unable to relieve the symptom-complex that we have associated with the so-called clinical entity, acidosis.

Dr. Mizell (closing).—In the beginning of my paper I stated the recognized fact that acidosis is usually, if not always, a secondary condition, even in the cases that I am describing here which I classified as a symptom and not as a disease *per se*. I particularly called attention to the skin and the relationship of the skin as an excreting organ in getting rid of the fatty acids.

In answer to Dr. Eustis as to the endogenous nature of the disease, I may say that two factors play a part in the chronic acidosis of the type of which I am speaking. In the acidosis of nephritis there is a retention of the acid radicles. That has been proven by Henderson and his associates. These patients practically all are thin; they are not well nourished. Whatever the cause, or whatever has brought about this condition, whether it be an attack of typhoid fever or malaria, or whether it be defective feeding as in a one-sided diet, the point is that we have a chronic condition of acidosis that undoubtedly has existed for some time, a slight acidosis, not of the type mentioned by Dr. Bassler at all.

I want to call your attention particularly to the difference in the fatty acids. We are working in the laboratories along the line of protein metabolism and carbohydrate metabolism, and until the last year or two have been practically ignorant as far as metabolism of fats is concerned. They occupy a very unique place in the economy in that it is the fats that are always called upon when the carbohydrates are exhausted. The fats are called upon in the starvation of diabetes. It is the failure of the tissues completely to oxidize the fats that gives rise to acidosis of starvation. The skin should be recognized as an eliminative organ of the acids. Perhaps there is not produced in the body of these patients an abnormal amount of acids, and if the skin is in good condition we would not have an acidosis. Whatever the primary cause, wherever it has started, the patient's skin is in such condition that it does not eliminate properly. Hence, the higher fatty acids are not eliminated.

I wish to thank Dr. Graves for emphasizing the point that we are trying to classify these cases and work out a rational treatment for them. It can be shown in the progress of the cases that they do not regain their strength and their normal health until the condition of the skin is improved. The volatile and soluble nonvolatile acids of the lower group are responsible for the acidosis that is relieved by giving alkalies and carbohydrate. If one watches the symptoms in this class of cases, one will find they will get worse when given alkalies. There is a chemical basis for that, and it is this: if alkalies are introduced into the body, they combine with high fatty acid and it renders the heavy molecules more readily oxidized. Then it is split up into one or a half dozen or more small molecules, each molecule has the same potential acid property that the parent molecule has, and that is the reason these patients do not improve on alkalies. It will increase the gingivitis and glossitis whenever you give them. I have experimented with patients, giving them alkalies for a while and then leaving them off, producing a gingivitis and glossitis; and putting them on excessive carbohydrates and then changing from that to a protein diet.

In this way it is possible to produce gingivitis and glossitis at will.

SURGERY

WAR, RAILWAY, INDUSTRIAL, GYNECOLOGICAL, OBSTETRICAL AND UROLOGICAL.

TREATMENT OF TROPICAL ABSCESS OF THE LIVER*

By John S. Helms, A.B., M.D., F.A.C.S., Tampa, Fla.

The title of this paper should be more correctly stated as "The Treatment of Amebic Abscess of the Liver," but the word tropical is used advisedly in this connection for the reason that we wish to bring out with emphasis the incorrect usage of the term. It has been quite conclusively proven beyond a question of argument that the socalled tropical abscess of the liver is due to amebic infection, although Koch's postulate has not been conformed to. The parasitic ameba of man is found to be distributed it is true more uniformly in the tropical and subtropical climates; but it is quite widespread throughout the temperate zones. In the United States particularly, it has been found in practically every state in the Union. Therefore, its almost universal distribution must be recognized, and its presence should be sought for in all cases where there is dysenteric or diarrheic disturbances.

The discovery of the parasitic ameba of man dates back to its first investigator, Lambl, of Prague, who described organisms appearing in the feces of a child in 1860, which he interpreted as ameba, although he attached no great importance to their presence. "Careful study of this report, however, shows clearly that he had a suspicion that the organisms were the cause of the diarrhea of the child." In 1875, a really accurate description of the ameba occurring in man was made by Loesch, of St. Petersburg, who had a patient suffering from dysentery and in whose feces numerous ameboid organisms were constantly found. These organisms were undoubtedly pathogenic in nature, and unquestionably he was studying the Entameba histolytica, the same pathogenic species which Schaudinn afterward described.

It was Schaudinn who first placed the study of the parasitic ameba of man upon a firm scientific basis. His publication appeared in 1903, in which he showed a specific difference between the pathogenic and non-pathogenic ameba of man, and gave us the classification which practically holds good today. To the harmless ameba he gave the name of Entameba coli, and to the disease-producing ameba, Entameba histolytica. "Schaudinn's work was first doubted, but recent zoologists such as Luhe, Braun, Hartmann, Minchin, and Stiles, Wenyon, Doflein, and Calkins, have given it complete recognition." We also owe much to Craig for original work in this field.

The parasitic amebæ of man, both pathogenic and non-pathogenic, possess morphological and biological characteristics by which they are distinguished and recognized quite readily and, as stated above, are quite universally distributed. In the tropical and sub-tropical countries they are frequently found upon green vegetables, especially upon salad vegetables, and occur in all probability in all green produce where contamination with human dejecta is possible.

We shall not undertake to describe the morphology and biology of the parasite. This question, however, should be quite closely studied by clinicians, and it undoubtedly offers a wide field for numerous discoveries.

We might state that the parasitic ameba within the intestines, or within the body of man, is not so easily destroyed as it is outside the body. Ipecac, not de-emetized, kills the cultured ameba in dilutions of 1 to 50,000 in twenty-four hours; emetin, 1 to 100,000; quinin, 1 to 200,000; and silver nitrate, 1 to 300,000. These experiments were carried out by Vedder. These results have not been applied, however, to the parasitic ameba of man.

*Read in Section on Surgery, Southern Medical Association, Eleventh Annual Meeting, Memphis, Tenn., Nov. 12-15, 1917.

Regarding the classification and nomenclature as stated above, Schaudinn brought out, in 1903, the fact that the intestines of man may be infested with two distinct species of amebæ, the Entameba coli which is non-pathogenic and the Entameba histolytica which is pathogenic.

"Stiles later wrote an exhaustive summary regarding the nomenclature of the amebæ of man in a very clear manner. For those who believe there is but one species of ameba, and that it is not congeneric with fresh water ameba, the correct name to use is Entameba coli, while for those who believe in a harmless and pathogenic species, the correct zoological names are Entameba coli and Entameba histolytica."

We have therefore the genus Entameba and the species Entameba coli and Entameba histolytica. There have been numerous other species described, some of which perhaps are of questionable value.

There is little doubt as to the causal relation between the Entameba histolytica and liver abscess of the tropical variety among those who are experienced in the observation of this disease. It must be admitted, however, that there is such a thing as bacterial infection and consequent abscess of the liver separate and apart from amebic infection, and that in most cases where the ameba is the primary cause of the liver abscess, there is also a bacterial infection. It has been proven that the ameba of man carries with it pyogenic organisms that might be in the blood stream and find lodgement in the area of lessened resistance of the liver due to the presence of ameba.

"Such authority as Councilman and La Fleur believe that the ameba alone causes the abscess, while Kruse, Pasquale and others believe that other organisms associated with the ameba cooperate in producing the abscess."

Webb states that

"the ameba alone can produce abscess of the liver, and that the sterile abscesses, sterile except for the ameba, can be carried for months or years with few symptoms or physical signs, and at some later time the abscess may become infected with pyogenic organisms. This would account for the prolonged history of these cases, with the absence of marked symptoms and physical signs, the absence of a decided leucocytosis and other septic symptoms in the cases of mixed infections."

Webb also suggests

"that since the ameba is an excellent carrier of micro-organisms it incorporates more than it can digest, and can often be seen disgorging them and strewing them along its path as it crosses the field of the microscope, and that this may be the case when it enters the portal circulation and is carried, conveying pyogenic organisms, to the liver."

The route through which the ameba passes from the colon or the rectum to the liver is conceded to be, we believe, by most authorities, through the portal circulation. This is also in line with the anatomical structure and the physiological functions of the parts under consideration. We believe that in all probability this is the only route taken. The large intestines being drained through the blood vessels into and through the portal circulation, and the absence of a liberal supply of lymphatics of this organ supports this theory. Furthermore, the ameba has been found to lie directly in the capillaries of this region.

The general conception is that the absence is usually a single one, but the experience of the best observers, however, seems to prove that in about 50 % of the cases the abscesses are multiple. I mention this particularly on account of the fact that it has an important bearing on proper treatment. Where the abscess is solitary it is generally located in the right lobe and usually near the convex surface, and in many instances its dome underneath the diaphragm.

The diagnosis of the presence of amebic abscess, or abscesses of the liver, is quite as important as (and perhaps more so than) the diagnosis of any condition that we may encounter, for it is our conception that the treatment of the disease is surgical, and it necessarily follows that as accurate diagnosis as possible should be made in order to have a proper basis for treatment.

The history of the case is exceedingly important. It should be accurately ascertained whether or not the subject has been affected with dysentery, or a more or less chronic diarrhea, particularly within the last two years, but should that time limit have been extended to six or eight years it should not be considered unimportant. It is quite important to have information about the subject's habits and diet, manner of living as well as climatic environment, for these matters have much importance in determining the possible causation of the disease. A careful examination of the feces should be carried out by a competent and experienced bacteriol-

ogist to determine the presence or absence of the Entameba histolytica.

Webb says:

"The classical symptoms are a hectic temperature, and night sweats. Leucocytosis occurs. We note diminished movement of the right half of the diaphragm, pain under the right scapula, dragging sensation on the right side with a fullness and tenderness in the right hypochondrium and rigidity of the right rectus muscle. But many of these symptoms may be absent. The liver has no sensory nerves, so a large abscess may form deep in its substance without causing pain. If the swelling is on the upper surface of the liver it is under the ribs, and not to be felt."

"In such a case we judge the likelihood of an abscess in a patient who has amebic dysentery and shows no plain physical signs of it by noting his general condition. If he is toxemic, losing flesh, with drawn face and a furred tongue, we may safely assume the presence of abscess" (Duckworth).

In some cases returning from the tropics the connection with dysentery is not easily traceable. In such cases the physical signs noted above, especially pain and loss of flesh, are important in the diagnosis. The spleen is not enlarged. Often a palpable tumor may be detected or an area of diffused dullness and tenderness in the right hypochondrium. Such symptoms would justify an exploration of the liver.

The x-ray is a useful aid in diagnosis and in determining the exact location of the abscess. The shadow shows increased density of the abscess wall, with a central area of lesser density than the normal liver tissue.

"Extension of inflammation in the liver to the lung may occur, first, by direct extension through the diaphragm, or second, by embolism of the pulmonary arteries due to the abscess' bursting into the hepatic veins, or into the vena cava" (Thompson).

The symptoms characteristic of pulmonary and pleural involvement are: first, severe pain in the shoulder which may be accompanied by pain and tenderness in the lower part of the chest; second, distressing cough; third, expectoration of chocolate-colored pus. This expectoration may be intermittent or constant. When drainage is good and expectoration fairly constant other symptoms are relieved. Pain and fever occur when expectoration ceases.

It is our personal belief that exploratory puncture with an aspirating needle without exposure of the liver is an unwarranted and dangerous procedure, and has no place in the diagnosis of this condition. In the first place, the abscess wall is usually more or less thickened due to the inflammatory process which has taken place within it, in which a temporary fibrosis occurs, rendering it difficult to puncture and rendering the needle liable to pass around the abscess unless, perchance, the sharp point of the needle presents squarely against its surface. Secondly, in order to make a successful exploration with the needle it is necessary to anesthetize the patient. In the third place, the contents of the abscess is of such nature, being thick and filled with necrotic masses, that it is almost impossible to get it to flow through an ordinary aspirating needle. In this way one might have the open end of the needle within the abscess and yet its presence escape notice. In the fourth place, there is great danger of spreading the infection. The ameba itself may be drawn into the tissues outside the abscess cavity, or pyogenic bacteria may be deposited along the tract of the exploring needle. This is particularly undesirable where it is necessary to pass the needle either through the pleura or through the peritoneum. There is also danger from hemorrhage from a perforated blood vessel. We would, therefore, particularly urge that this is a dangerous, unnecessary, and unsurgical procedure as a means of diagnosis.

After the diagnosis has been made we believe that there is no other treatment except surgical that is based upon any certainty of good results. It has been our practice, and we are convinced it has a rational basis, to adopt the open treatment and to affect drainage through the transperitoneal route, and we are convinced after a rather large experience with operation upon these cases, that it is always practical.

It is claimed by some that in those cases particularly where the abscess is solitary and situated at the dome of the right lobe, that a rib resection is necessary in order to affect drainage. We have found that these cases are quite easily drained trans-peritoneally and much more safely. If a rib resection is done the bone has to be dealt with, which lends an element of complication. The pleura is ofttimes punctured, which gives an added danger

of infection. Undesirable adhesions of the wounded chest walls are bound to be among the end results in the event the case terminates successfully in so far as the cure of the abscess itself is concerned. Furthermore, in the event of multiple abscesses, an opening through a rib resection can never be large enough to enable one to locate and drain more than one abscess, or possibly two. Complete exploration of the liver is practically impossible through this sort of incision.

It is our conviction that an adequate trans-peritoneal opening should be made through which a complete palpation, and also complete inspection of the liver, can be had. In this manner and no other can an accurate diagnosis be made as to the number and location of the abscesses. It has been our habit to make the Bevan incision, or some modification of it, which gives us the best access to the liver. The liver is then examined by palpation and inspection, and, if necessary, by exploratory punctures after having properly walled off the adjacent organs with gauze pads. Where an exploratory puncture is necessary we use a medium size trocar and canula insertions for the presence of pus. Where the abscess is solitary and situated at the dome, and adhesions have formed between the diaphragm, or the parietal peritoneum and liver, we consider it wise and good practice to separate as many of these adhesions as is necessary to gain approach to the area directly over the abscess. The presence of the abscess, or abscesses, is usually indicated by more or less bulging or thickening of the liver substance and a whitish condition of the surface of the liver capsule. Having been located, they are carefully surrounded with gauze pads and a large size Ochsner gall-bladder trocar with a rubber tube attached is passed slowly and directly into the abscess cavity. The trocar is removed and the pus usually flows through the canula and through the rubber tube and into a receptacle at some distance from the patient, thus avoiding the possibility of contaminating the peritoneum or any part of the wound with the abscess contents. The canula is then carefully withdrawn, the surface of the liver carefully wiped off, a curved Kelly forceps passed gently through the path of the trocar. the blades gently separated after reaching the cavity, until the opening is so enlarged that moist gauze sponges can be passed into the cavity for thorough cleansing. It is good technique, and in line with proper treatment to moisten these sponges with 1 to 50,000 emetin solution, or 1 to 10,000 solution of quinin, or other amebacidal solution. Then a large rubber tube properly perforated at its end of sufficient size to fit snugly the opening is passed down into the abscess cavity and brought out through the abdominal wall.

If there are multiple abscesses, and they are situated in such a way that the small ones can be drained through the original larger ones, it is a method of choice to drain them in this manner. If they are more accessable through the surface of the liver each one should be treated as above described. The abdominal wall, after removal of the gauze packing, is now closed about the drainage tubes. In this technique there is the smallest possible chance of infecting the peritoneum and the wound surfaces, and being thoroughly drained it gives opportunity to apply amebacidal remedies to the surface of the abscess cavity.

We do not believe it is compatible with good surgery to hunt blindly for these abscesses with an aspirating needle, and when we think we have found them to inject a solution of emetin, quinin, or other amebacidal agents into them. In the first place we are working in the dark and can never know positively when we have reached the abscess cavity. If we have a pyogenic infection, together with amebic infection, we can not hope to destroy it with the anti-amebic remedies. There is also danger of hemorrhage through puncture of an important vessel. If this procedure is carried out, unquestionably it should be done only after the liver itself has been explored through an adequate external opening and injection done directly and only through the liver substance, and under the direction and control of inspection and palpation.

In the treatment of these cases we consider it a very important adjunct to administer hypodermatically emetin hydrochlorid in one-half to two-grain doses daily. It goes without saying that the

patient should have supportive treatment.

In closing I desire to emphasize two or three points which I consider to be important. First, that it is an unnecessary and a bad practice to make exploratory punctures for diagnostic purposes. The diagnosis can be readily made, and quite as certainly, through the other means that have been indicated. Moreover, it is a dangerous practice on account of the fact that the exploring needle will nearly always of necessity have to be passed through a part of the pleural cavity or through the peritoneum, and in this way these cavities are liable to be contaminated with infectious bacteria.

The second point that I wish to impress is that these cases should always be treated by the open method unless there is some contra-indication to operation. And third, that the peritoneal or abdominal route is the safest and best avenue of approach and gives as good opportunity for reaching and draining the abscess as any other and does away with the danger of infecting the pleural cavity or the lung.

Lastly, I believe that local application of amebicidal remedies through the operative wound is an important part of the treatment.

BIBLIOGRAPHY

General

Barrow, S. C.: "X-Ray Diagnosis of Abscesses of the Liver," Journ. Advanced Therap., 30:169 (1912).

Cantlie, J.: "Hepatic Abscess," Journ. Trop. Med., 13:248 (1910).

Cantlie, J.: "Rupture of Hepatic Abscess Into the Lung," Brit. Med. Journ., 2:961 (1910).

Darricarrer, J.: "Apropos des Abces Hepatiques Amibiens," Gaz. d. Prat, 20:265 (1913).

Duckworth, D.: "Diagnosis and Treatment of Tropical Hepatic Abscess," Practitioner, 93:1 (1914).

Dudley, F. W.: "Liver Abscess," Surg. Gynec. and Obstetrics, 11:187 (1910).

Fontan, J.: "Les Grandes Abces du Foie (Hepatite Suppuree des Pays Chauds''), Paris, 1909.

Harrison, J. H.: "Multiple Abscess of the Liver," Journ. Trop. Med., 13:77 (1910).

Herrick, A. B.: "Abscess of the Liver," Surg. Gynec. and Obstet., 11:472 (1910).

Kelly, W. D. C.: "Multiple Tropical Abscess of Liver," Journ. Roy. Army Med. Corps, 21:689 (1913).

McLean, J. H.: "Tropical Abscess," Texas Cour. Rec. Med., 29:13 (1911-12).

Rivet, L.: "Les Nourvelles Methodes de Diagnostic et de Traitement des Abces Dysenteriques du Foie," Bull.. Gen. d'Therap., 166:848:895 (1913).

Sambuc, E.: "Notes Clinques sur les Abces de Foie au Tonkin," Ann. de Hyg. et d. Med. Colon., 16:48 (1913).

Smith, R.: "Report of Twenty-eight Cases of Tropical Abscess of the Liver," Cali. State Journ. Med., 10:300 (1912).

Thevenot, L., and Plontz, G.: "Formes Anommales des Abces du Foie d'Origine Amibienne," Proges. Med., 3d ser., 29:41 (1913).

Thompson, J. E.: "Pleural and Pulmonary Complications of Tropical Abscess of the Liver," Ann. Surg., 59:891 (1914).

Thurston, E. O.: "Series of 101 Cases of Abscess of the Liver," Indian Med. Gaz., 49:88 (1914).

Webb, W. D.: "Abscess of the Liver," Washington Med. Ann., 13:27 (1914).

Treatment

Baur and Plisson: "Traitement des Abces du Foie par l'Emetine," Soc. d' Med. Mil. Franc., 7:654 (1913).

Bell, J.: "Case of Liver Abscess Treated Without Operation," Journ. Trop. Med., 17:33 (1914).

Chaterji, K. K.: "Emetine in Hepatitis and Amoebic Abscesses of the Liver and Spleen," Indian Med. Gaz., 49:108 (1914).

Chaufford, A.: "Abces Dysenterique du Foie—Traitement par la Ponction Evacuatrice et l'Emetine," Bull. et Mem. Soc. Med. d. Hop d. Paris, 3d ser., 35:746 (1913).

Fink, L. G.: "Liver Abscess Treated by a Modification of Roger's Method," Journ. Trop. Med., 15:339 (1912).

Gaide, L., and Mouzels, P.: "Note sue le Traitement des Abces du Foie par l'Emetine," Bull. Soc. Path. Exot., 6:716 (1913); also in Ann. d Hyg. et d. Med. Colon., 16:1150 (1913).

Gaide, L., and Mouzels, P.: "Traitement des Abces du Poie Dysenteriques," So. d Med. Mil. Franc. Bull., 7:297 (1913).

Gay-Bonnet: "Traitement des Abces du Foie Dysenteriques," Soc. d Med. Mil. Franc. Bull., 7:297 (1913).

Mallahan, S.: "Emetin and Liver Abscess," Indian Med. Gaz., 48:331 (1913).

Mallahan, S.: "Value of Emetine in Liver Abscess," Brit. Med. Journ., 1:1206 (1913).

Muir, E.: "Ipecacuanha Treatment of Liver Abscess," Indian Med. Gaz., 46:18 (1911).

Newman, E. A. R.: "Operative Treatment of Hepatic Abscess," Indian Med. Gaz., 49:97 (1914).

Nott, A. H.: "Emetine and Liver Abscess," Indian Med. Gaz., 49:101 (1914).

Phillips, L.: "Amoebiasis—Treatment of Liver Abscess Discharging through the Lungs," St. Barth. Hosp. Journ., 20:159 (1912-13).

Rogers, L.: "Prevention and Treatment of Amebic Abscess of the Liver," Philipine Journ. Sci., Sect. B, 5:219 (1910).

Rogers, L.: "Treatment of Amoebic Abscess of the Liver," Indian Med. Gaz., 45:493 (1910).

Sewall, E. P.: "Case of Amoebic Abscess of the Liver Cured by Emetine Hydrochloride," Journ. Royal Army Med. Corps, 20:700 (1913).

Spittel, R. L.: "Effects of Emetine on Abscess of the Liver," Brit. Med. Journ., 2:1058 (1913).

Sanford, A. H.: "The Geographic Distribution of Amebiasis," Journ. Am. Med. Assn., LVII, 1916, 1923, 1926.

Craig, C. F.: "The Parasitic Amoebae of Man," Phila., Lippincott, 1911.

Calkins, C.: "Protozoology," Philadelphia, 1909.

Councilman and LaFleur: "Amoebic Dysentery," Johns Hopkins Hospital Report, 11, pp. 395-548, 1891.

Cunningham, D. D.: "On the Development of Certain Microscopic Organisms Occurring in the Intestinal Cana.," Quar. Jour. Micro. Sci., 1881, V. Ser., 21, LXXII, p. 234.

Kruse, W., and Pasquale, A.: "Studium des Dysenterie und d Leberabscesse," Deutsche Med. Wochenschr., 1893, 15, 1, 354, 16, p. 368.

"Lambl. Beob. u. Studien aus dem Franz-Joseph-Kinderspital in Prag," I, p. 362, 1860.

Loesch, F.: "Massenk Entw. v. Amoeben in Dickdarm Virch. Arch. f. Path. Anat.," LXV, p. 196, 1875.

Patterson, H. S.: "Endemic Amoebic Dysentery in New York, with a Review of Its Distribution in North America," Am. Jour. Med. Sci., 1909, CXXXVIII, p .198.

Rogers, L.: "Tropical or Amoebic Abscess of the Liver," etc., Brit. Med. Jour., 1902, No. 2177, p. 844.

Schaudinn, F.: "Ueber den Zengungskreis von Paramoeba eilhardi; neue Genus, neie Species," Sitzungst d. h. preuss. akad. d. Wissench., Berlin, p. 31, 1896.

Stiles, C. W.: "Report on Classification of Amoeba Coli," Am. Public Health Assoc. Rep., XXX, p. 292, 1905.

Stiles, C. W.: Personal communication, 1915.

EYE, EAR, NOSE AND THROAT

A MIXED TUMOR OF THE LACHRYMAL GLAND*

By Adolph O. Pfingst, M.D., F.A.C.S.,
Professor of Ophthalmology and Otology,
University of Louisville, Medical Department,
Louisville, Ky.

Mr. McC., a robust farmer, aged 48 years, of good personal and family history and of good habits, noticed the first symptoms referable to his left eye four years ago. The eye-ball was then turned slightly downward. This deviation gradually increased, and after several months had become quite apparent. The patient then noticed that a small projecting mass could be felt by pushing the finger deep under the orbital edge close to the external angular process. This mass gradually became larger until the eye deviated considerably downward and became more prominent. It was this deviation of the eye that led the patient to seek medical advice, for he had noticed no other symptoms — such as pain or diplopia.

When he applied for treatment, September, 1914, there was only a very slight exophthalmus, but quite an apparent deviation of the eye downward measuring half an inch (measured by stretching a thread horizontally across the face and passing across both corneae).

Movements were limited in an upward direction, especially in looking toward the temporal side.

Upon palpating the orbit under the external angular process, a fixed mass could be followed as deep as the little finger could reach. It extended laterally from near the middle of the orbit to the external angular process. The mass was firm, seemed to have a smooth surface and had rounded edges resembling the feel of a mucocele of the frontal sinus, gravitating into the orbit as we find at the inner orbital angle. There was no glandular enlargement in front of the ear nor in the neck. X-ray examination showed clear frontal sinuses and excluded the possibility of an osseous growth. The interior of the eye showed more tortuosity of the veins than the right eye and some blur of the optic nerve edges. The tension of the eye-ball was considerably less than normal. V 20/200. No appreciable change in the visual field.

The right eye was normal. V. 20/20.

A diagnosis of tumor of the lachrymal gland was made and operation advised.

The removal of the growth through the lid was the method chosen. After preparing the field in the usual way and with the patient under ether anesthesia, an incision was made beginning at the junction of the middle and nasal third of the supra-orbital edge and following the rim to the external angular process or to a point a little below the level of the external canthus. The incision was made through the skin, fascia and muscle, and by careful dissection with scissors and forceps the capsule of the tumor was readily reached. The body of the tumor was grasped with a tenaculum and the mass was shelled out of its bed without difficulty by means of a dull dissector, leaving a clean surface under the roof of the orbit.

Its relation to the lachrymal gland could not be determined. There was little bleeding and this was controlled by packing with gauze.

Deep interrupted sutures were placed, including the muscle tissue.

The wound healed readily by primary union. The eye-ball receded, but marked ptosis was still present when the patient left the infirmary.

When he was last seen in November, 1915, fourteen months after the operation, the ptosis had entirely disappeared — the eye having returned to its normal position. There was no evidence of a recurrence of the growth. Vision had returned to 20/40.

The tumor immediately after removal was a perfect oval with smooth surface and of firm consistency and measured 1½ x 1¼ x 1 inches. It weighed 3½ drams.

The specimen was placed in 5 % formalin and was given Dr. Leon Baldauf, former Professor of Pathology, University of Louisville Medical Department, for microscopic examination and to whom I am indebted for the following report:

"Sections of the tumor were stained with hematoxylin and eosin.

"They include the capsule, which is made up of a rather dense connective tissue showing some hyaline transformation and very few neuclei. Beneath this capsule are a number of gland-like structures, evidently compressed and lined with a single layer of cuboidal epithelium. These epithelial structures are imbedded in a firm connective tissue stroma which has also undergone some hyaline change. The stroma lying within is rather loose, the spaces between the fibers containing a finely granular material staining with hematoxylin. The connective tissue here, while it has the appearance of myxomatous tissue, is probably an edematous connective tissue. Sections of a rather large vessel here show some proliferation of the sub-endothelial tissue. In the rather loose mass of connective tissue already described a few dense strands of connective tissue are visible stained with eosin. Within this stroma are a number of spaces surrounded by a double layer of cells showing round to oval nuclei which stain rather deeply. Within these spaces are to be found masses of a finely granular material which take a faint stain with eosin. The stroma separating these gland-like structures is rather cellular, while in many places the spaces are practically united by cells similar to

*Read in Section on Eye, Ear, Nose and Throat, Southern Medical Association, Eleventh Annual Meeting, Memphis, Tenn., Nov. 12-15, 1917.

those lining the spaces. The tissue here and there shows much less stroma and presents a decidedly cellular appearance made up of cells which are infiltrating in every direction, having lost their glandular arrangement. Nearer the center of the tumor the glandular arrangement reappears; the stroma, although cellular, becomes more abundant and the double layer of epithelium presents an inner endothelial lining. Here the cellular elements begin to change and instead of the cells with round and oval nuclei we have tissue invaded with masses of cells which have a decided spindle-shaped appearance. The colloidal-like material in the gland-like lumina has here taken on a rather concentric arrangement, resembling very much corpora amylacea. These masses for the most part take the eosin stain while a few take a deep hematoxylin stain, evidently due to a calcareous change. At the outer edge of section a small mass of typical hyaline cartilage is visible.

"Microscopic diagnosis: mixed tumor of the lachrymal gland."

Primary tumors of the lachrymal gland have been reported from time to time since the latter part of the sixteenth century. However, as most of the cases were contributed to literature before the development of the microscope, little is known of the nature of the early cases which were classified largely according to their clinical course. In the main their clinical course indicated that they were of a benign nature.

The first reported case, including microscopic examination, was published by Becker in 1867. But even after this most of the tumors were reported without microscopic findings or with only a very meager description so that considerable confusion has arisen regarding the pathology of these tumors.

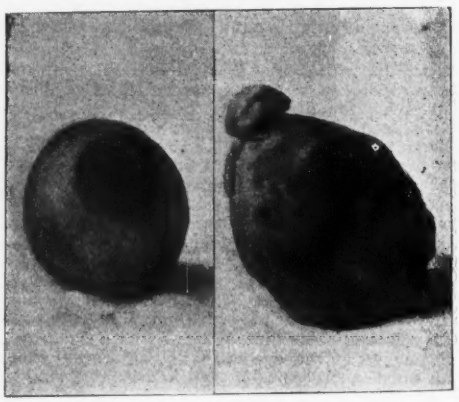
In 1901, A. S. Worthin (Archiv. of Oph., 1901, p. 631) reported a case of lachrymal gland tumor with detailed microscopic findings and made an exhaustive review of the literature embracing 132 cases, in an endeavor to bring about a better classification of tumors of the lachrymal gland. Worthin concluded that the majority of the growths of the lachrymal gland described in literature under widely different heads were mixed tumors most probably of endothelial origin similar to those of the parotid and submaxillary salivary glands. He believed that they form a type peculiar to the serous variety of salivary glands which differs from the endotheliomata found in other parts of the body in their tendency to form cartilage and hyaline and myxomatus tissue. Worthin upholds the justification of referring to these growths as endotheliomata as they apparently arise from the endothelium of the lymph spaces, although, as he says, the term is somewhat misleading in view of the fact that endotheliomata elsewhere are of a sarcomatous nature and are for the greater part very malignant, whereas most of the growths of the lachrymal gland are of a benign nature, showing no tendency toward malignancy.

Worthin further suggested that the peculiar histogenetic formation of the lachrymal gland tumors warrants the employment of some special designation to indicate their make-up.

To indicate both the histogenesis and the structural characteristic he suggested that the growths be designated myxoendotheliale—chondro - endotheliale—myxochondro-endotheliale, etc.

Three years after Worthin's report, Verhoeff (Journal of Medical Research, 1904), published his microscopic findings in five cases of tumor of the lachrymal gland removed at the Massachusetts Eye and Ear Infirmary.

Like Worthin, he believed that most of



Tumor with normal human eye to show comparative size.

the growths of the lachrymal glands are mixed tumors and that they are analogous to neoplasms of the salivary glands. However, his views regarding the histogenesis of these tumors do not coincide with those of Worthin.

With special staining methods, he believed that he was able to demonstrate that they spring from epithelial structure and not as Worthin believed from endothelium. He demonstrated structure such as a fenestrated internal membrane in the gland-like lumina of the parenchyma of the tumor and the presence of a basement membrane of connective tissue beneath the marginal cells in the cylindromatous areas.

The presence of pearls, kerato-hyaline granules and prickle cells were also believed to be indicative of an epithelial origin.

Verhoeff further points out that tumors of the lachrymal gland are more apt to be of epithelial origin, springing, as they do, from an essentially epithelial structure. He does not believe that the apparent transition of endothelial lining of lymph spaces or blood channels into the parenchyma is proof of an endothelial origin, for such findings could just as readily be interpreted conversely as an invasion of the lymph spaces by the tumor cells, and as proof thereof calls attention to similar pictures found in epithelial growths (carcinoma).

Just prior to Verhoeff's report Wood contributed a report of 54 cases of tumors of the salivary glands (Annals of Surgery, 1904) in which he concluded that 95 % of these growths are mixed tumors and that their parenchyma is of an epiblastic origin.

The most recent exhaustive report and compilation of literature on tumors of the lachrymal gland was published by Greeves (Royal Hospital Ophthal. Reports, 1914). It includes all of the cases published after Worthin's compilation and represents 42 cases, nearly all of which include minute histological details. Greeves suggested as a basis of classification of primary tumors of the lachrymal gland that they be divided into two main groups: (a) mixed tumors; and (b) tumors having distinct histological structures characterized by an overgrowth of small round cells in the gland stroma.

In the first group he places three types of tumors:

First, a complex type in which are found gland-like structures, squamous epithelium, prickle cells and often cartilage. They occur with greatest frequency and at ages varying from 18 to 77 years. They are slow in their growth. Recurrence took place twice in nine of his cases and general metastasis occurred in none of them.

Second, a type characterized by the formation of branching columns of epithelial-like cells in an almost entirely myxomatous stroma. In three out of seven of these cases recurrence occurred — no metastasis.

Third, the cylindroma type, — microscopically and clinically the most malignant of the three types. There is in this type a strong resemblance microscopically to adeno-carcinoma, especially in the advanced part of the tumor. In three out of seven of these cases recurrence took place. Cartilage does not occur in this type.

Illustrating deviation of left eye downward.

These tumors occur in adult life. They are largely of slow growth, and are not associated with enlargement of lymphatic glands and have never been known to lead to general metastasis. When removed they show no tendency to recur.

In the few cases in which they caused death it was due to direct spread of the

growth to the cranial cavity through the supraorbital plate by pressure. They are never multiple. Owing to their proximity to the brain their early removal is advisable.

The second group of growths (Class B) are characterized by an overgrowth of small round cells in the stroma between the gland acini which finally undergo destruction by pressure. Although they resemble sarcomata histologically, they do not run the clinical course of malignant growths, as they have only in exceptional cases shown malignant tendencies.

They occur in one or both lachrymal glands and have frequently been observed with coincident involvement of one or more of the salivary glands.

Although Greeves, in his report, reviews the opinion of others regarding the histogenesis of these growths he offers no opinion himself as to their origin.

The specimen presented tonight is evidently a mixed tumor of a benign nature. It has all of the structures found in a normal lachrymal gland entering into its make up. There is a preponderance of fibrous tissue which has undergone myxomatous changes. Between the fibrous trabeculæ normal gland tubes with cubical cell lining are present. There are also some larger spaces—apparently distended gland acini lined with two layers of cells. In some of these spaces the epithelial cells have taken on the pearl-like arrangement. The growth has numerous thin-walled blood vessels.

Following the classification of Greeves the growth would come under his first subdivision of mixed tumors. Histologically, it is identical with most of the reported tumors of the salivary glands. When we consider that the histological make-up of the lachrymal gland is almost identical with the so-called serous variety of salivary gland that enters into the make-up of the parotid and part of the submaxillary glands and of the pancreas, and further that the similar structures are found in tumors of all of these glands, Worthin's belief that they are kindred growths can readily be accepted.

The question of origin, whether endothelial or epithelial, has been much discussed, but has not been determined, and it is not my intention to enter into a discussion of this phase of the subject. In parts our specimen shows the tongue-like protuberance of massed cells apparently budding from the endothelium-lined spaces between the fibrous stroma, upon which Worthin based his conclusion of their endothelial origin. In parts it contains the pearls, the hyaline and myxomatous tissue suggestive of epithelial origin.

Southern Medical Journal
JOURNAL OF THE
SOUTHERN MEDICAL ASSOCIATION
Incorporating Gulf States Journal of Medicine and Surgery and Mobile Medical and Surgical Journal

Published monthly. Price $3.00 the year; 25 cents the single copy.
Address Southern Medical Journal, Empire Building, Birmingham, Alabama
Entered at the Birmingham, Ala., postoffice as second-class matter under Act of Congress, March 3, 1879

*Dr. SEALE HARRIS, Editor
Dr. M. Y. DABNEY, Acting Editor
Dr. J. R. GARBER, Associate Editor
C. P. LORANZ, Business Manager

*Major, Medical Reserve Corps, U. S. Army, on active duty overseas. Granted leave of absence for period of war.

Vol. XI AUGUST 1918 No. 8

EDITORIAL DEPARTMENT

Southern Medical Association, Twelfth Annual Meeting, Asheville, N. C., November 11-14, 1918.

MALARIA CONTROL

If there could be such a thing as the embryological study of malaria it has been recorded in the pages of "ancient history." Indeed, all of the present-day work on this disease is but a logical fulfillment of the numerous possibilities that were expounded following the epoch-making accomplishments in the Canal Zone, in Havana and other malaria-infested districts. Boiled down to the last analysis, two axioms can be stated that embrace the entire discoveries of Gorgas, Reed and others. They are: malarial infection can be prevented and it is worth-while preventing. Therefore, it seems that the public health servants, medical and lay organizations, must cease further debate upon this subject other than that concerning the ways and means of establishing maximum control of the infection.

To review the appalling mortality statistics that were compiled in the early study of malaria, is but one method of presenting to our minds that the clean up and prophylactic work that has been inaugurated throughout every malarial district has always been a current issue; and then, to review the incredible advances reflected by mortuary statistics, should spur us on in this great undertaking.

The U. S. Public Health Service, the National Malarial Committee, the Section on Public Health of the Southern Medical Association, the heads of state and county health boards, the various railroads, public spirited insurance companies and periodical-publishing institutions, public health societies of men and women, and finally, the physicians, collectively and individually, are the dynamic forces through which we may anticipate a complete eradication of the anopheles and its habitats.

This field of work presents many phases of activities, including domestic and rural sanitation, special laws governing the reporting of malarial infections or even a mere suspicious case, a comprehensive educational propaganda, extensive geologic surveys and the actual care of those harboring the plasmodium. Brilliant results have crowned the efforts of the pioneers and the later-day students of malaria, and it is but a natural conclusion to await confidently the day that this peculiar scourge of tropical and semi-tropical zones will be but a memory. No longer will it stamp the ear-marks of inefficiency upon the soldier, the sailor, the farmer, the laborer, the school child and others of the human family upon whom depends the progress of civilization. The excellent symposium on malaria that appears in this issue of the JOURNAL is but a mute endorsement of the bonded obligation we feel and owe the armies arrayed against this winged foe of health.

The Southern Medical Association considers its work on malaria greatly enhanced by the correlated efforts of the National Malarial Committee; and it feels sure that all of its members realize the inestimable value of the joint meetings

that have been arranged for in the past. In this connection it will be highly pleasing to know that Surgeon-General Blue, Chairman of the National Malarial Committee, has seen to it that the next annual meeting of this Committee will be held with the Southern Medical Association at its annual meeting in Asheville, November 11-14. He urges every one interested in this work to be in attendance.

TO OUR READERS

The unusual status of things commercial, coupled with a desire to co-operate with the Government in every possible manner, has led the JOURNAL to make some minor changes in the publication department. There has been no cheapening either in materials used nor in its literary excellence: these characteristics will remain a constant quantity unless more perplexing problems arise.

Within the past year the cost of paper has advanced steadily and today finds us paying an increase of 40 to 50 % for the same quality that was formerly used, although that used at present is 25 % thinner. Then, the cost of printing is at high-tide, due to the enormous increase in the price of printing materials and labor. Unfortunately, associated with this increase in production there has been no opportunity to increase revenues through advertising, as business conditions will not warrant a boost along this line. These exigencies have come about by a natural sequence of events. However, to add to the increased expense and difficulties of operation, Congress has imposed further taxation by enacting into law the present second-class postal rates. This in itself must influence the management of any periodical. Finally, the Government has called upon all publishers of large and small calibre to conserve paper; and we see no reason why we should not do our "bit" in this respect. Indeed, it would hardly be consistent for the members of the Association to make extreme sacrifices and for their official organ not to emulate such patriotic examples.

In conclusion, the business management wishes to call attention to the fact that postage for first-class matter is a large item, due to the advance of 1 cent on each letter, and urges the greatest co-operation in adjusting membership-subscription accounts. Upon receipt of a statement remit at once, which will thus eliminate much of the "follow-up" correspondence with its attendant expense and annoyance. Better still, just mail your check without waiting for even the first statement.

WAR A STIMULUS TO SURGERY

"It's an ill wind," etc., applies alike to warfare as to many other phases of life. Surgery in particular has often been the gainer from long and bloody wars which have cost thousands of lives and millions of dollars. It is merely another illustration of the fact that where resourceful surgeons are thrown with large supplies of clinical material new discoveries may naturally be expected to follow.

For instance, Ambrose Pare, the greatest surgeon of his time (sixteenth century), while forced into a military career through no wish of his own, on the battlefield made his monumental discovery, when his oil gave out, that those wounds into which boiling oil had not been poured got along much better than those which received such treatment. In other words, he almost orignated the practice of asepsis[1] and would have done so had he not found it impossible to throw off his superstitious custom of applying a salve made of the "fat of puppy dogs."[2] Through his military experience he also made himself immortal by reviving the use of the

ligature of Celsus for blood vessels instead of the cruel hot iron of that preanesthetic era.

Larrey, whom Napoleon remembered in his will and pronounced "the most virtuous man I have ever known," was "the greatest French military surgeon of his time." He it was who first amputated at the hip joint, who instituted the "flying ambulance," and who originated "first aid to the wounded."

In our own country we need only recall that "our Civil War produced a great advance in the treatment of fracture of the femur. Gurdon Buck gave us his extension. Nathan Ryno Smith gave us his suspension splint. John Thompson Hodgen, by his ingenuity, combined both valuable features in one, and produced his suspension extension splint."[3]

And this present World War has not been lacking in its advances in plastic surgery and in the scientific handling and treatment of wounds, as exemplified by the successful use of the Carrel-Dakin method of wound sterilization, dichloramin-T oil, and "BIPP." By the proper employment of these agents a marked improvement is noted both in the time necessary for recovery and the extent of recovery. Even compound fractures, formerly a source of the greatest concern, are usually found to respond with amazing rapidity to the Carrel-Dakin or dichloramin-T treatment.

A reflection over these marvelous results which have been, and are now being, obtained as the result of military surgical experience, makes one almost believe that Hippocrates was right when he said that "war is the only proper school for the surgeon."

1. Garrison, F. H.: "An Introduction to the History of Medicine," 2d Edition, p. 210. W. B. Saunders, 1917.
2. Ibid, pp. 93 and 211.
3. Nifong, F. G.: "The Hodgen Wire Cradle Extension Suspension Splint," p. 6. C. V. Mosby, 1918.

PELLAGRA

Some ten years ago the medical profession, especially that of the South, found itself confronted with the sudden appearance of pellagra; and well does the writer recall with what helplessness the physicians endeavored to combat the enormous toll that this malady exacted at that time, and even subsequently. No reflection is cast upon the doctors in their inability to achieve far-reaching results, for practically nothing was known of its etiology, and hence the proper therapeutic measures were lacking. How many recall the very universal use of sodium cacodylate, of the rather frequent administration of salvarsan and of the employment of other antispecific agents in an attempt to combat the disease?

An adequate idea of the mortality records of the early years of this disease can be adduced from a comparative analysis of such records as were presented by several states for 1916: 677 deaths in Alabama, or third place among all diseases; 840 in Mississippi, or fourth place; 467 in North Carolina, or fourth rank; 627 in South Carolina, or second rank; 607 in Tennessee; and 452 in Texas—a total of 3,700 deaths from pellagra in these six states.

Early in the study of the disease many theories were advanced as to the causative factor and mere mention of impure corn, of too great corn diet, of the results of poverty, of certain insects as probable solutions, will revive memories in physicians and laity. Thanks to the intensive study instituted by that monument of health conservation, the U. S. Public Health Service, many of the baffling mysteries of pellagra have been solved; and standing out pre-eminently at the head of this work is the discovery of the exciting and predisposing cause with a subsequent scheme of treatment. The report from research students give us but one answer,

and in these few words, "an unbalanced diet," is embodied the explanation.

A review of the latest Government report, based upon practical experiments in prisons, asylums and orphanages, proves conclusively that no blood, no matter how royal, is immune to pellagra. To quote a telling statement by Surgeon Goldberger, U. S. Public Health Service, in his report of April, 1918:

"A properly-selected or well-balanced diet is one that includes in sufficient quantities and in proper form all the elements needed by the body for its healthy growth and normal activities. In order that a proper balance may be assured, the diet should include, besides the cereals, starches, sweets, and fats, a sufficient quantity of milk or some lean meat and an abundance of green vegetables and fruit and preferably some of all of these classes of foods. * * * The vitally important practical thing, however, is that the right kind of diet will keep people from having the disease and will cure those who have it if the cases are not too far advanced. Milk is the most important single food in balancing a diet and preventing or curing pellagra."

The nature of pellagra has been sufficiently elaborated and the knowledge has been spread among physicians to such an extent as to warn every one that the cure of the disease lies in its prevention, and that in the prevention its recognition is made manifest. Those of the profession of a retrogressive tendency must no longer sin by acts of omission, but should readily embrace the findings of scientists, and despite the fact that their patient may have as much to eat as any doctor's patient, they should bear in mind that there is a difference in having things to eat and the actual, bona fide partaking of such edibles.

MORE ABOUT MEDICAL EDUCATION

For the past score of years the medical profession has sensed its peculiar obligation to society; and in true form has risen above many obstacles and has accomplished very wonderful and quite necessary reforms in the advancement of scientific medicine. It would be an endless task to enumerate the names of many of the pioneers in medicine who bestowed upon posterity the rich harvest of a fruitful career. On the other hand, neither time nor space will permit of the recital of the advancements made in the conduct of the practice of medicine, and especially in the question of medical education.

At the beginning of America's participation in the great world war it became very evident that the medical profession was destined to play an important role in the successful prosecution of hostilities. No mention will be made of the heroic and unparalleled sacrifices and achievements chronicled by members of the medical staff of the U. S. Army and Navy. It is a logical conclusion that had not the medical institutions been far in advance of the absolute needs of the country up 'till 1917, the personnel of the Medical Corps would be rather inferior as compared with those of our Allies, and perhaps amazingly inadequate for the multitudinous and difficult duties that have devolved upon it. It is due to the timely foresight of those in charge of preparing students for the practice of medicine that our present-day efficiency is of world-wide merit and comment; and it seems to the JOURNAL that a more fitting monument could not be erected to those seers of education than to perpetuate this important work according to precepts laid down by them and the present-day masters of education.

How to raise the requisite number of physicians for the Army and Navy with least privation to the civil population has been a problem for the Surgeon-Generals and the heads of the medical colleges to unravel; and it is interesting to note that the war-time policy of medical schools* is now being tried by numbers of colleges in the United States. With this phase of the question solved, it no longer remains

*See editorial in the JOURNAL for May, 1918

for us to point out how soon graduates can be turned over to the Government for Army service; but we should bestir ourselves to decide in what manner more proficiency can be attained so that the new recruits of the Medical Reserve Corps will fully measure up to the standards of those already enlisted.

Shall we meet the emergency by lowering the entrance requirements of medical colleges or by eliminating a major portion of the preliminary cultural and scientific courses? Those in favor of such a procedure are laboring under the mistaken idea that there is a great scarcity of physicians or that the medical schools will suffer to such an extent that some may be forced to close their doors. The first premise may be answered by asserting that a relative dearth of physicians actually existed before the war made the sudden demand upon the profession, because there was an increased need of the graduates to become hospital internes, research men in institutions devoted to such purposes, health officers, medical inspectors, medical teachers and to fill other positions of responsibility. This condition did not exist so many years ago because the medical graduate was not qualified by reason of deficient educational opportunities. The second premise may be disposed of by referring the reader to the classification of medical colleges as determined by the Council on Medical Education of the American Medical Association. Then let us ask the pertinent question: could not many of these schools, even of Class B standing, be abolished without any harmful results? The demands made upon the Army physician require an intensive training in the various branches of medicine; and unless the curriculum of the colleges, as presented by Class A schools of today, is maintained, the records of the Army will not be so resplendent as in the past, nor will the physician in civil practice be a worthy competitor of his more polished and highly educated colleague. By no means must a low premium be placed upon the foundation of the structure that represents the development of the highest faculties.

It is to be hoped that the sections on medical education of the various associations will wage an active campaign that will be the death-knell of all retrogressive steps in the privileged mission of developing the embryo student into a full-fledged, worth-while, capable practitioner.

THE POSTAL ZONE RATE

The oppressive and very annoying new postal zone law is now effective. Prior to July 1, the date set for the operation of this recent legislation, it was hoped that Congress would realize the deleterious effect of such enactment and by a unanimous vote revoke the law that is destined to mean bankruptcy for some periodicals, that foreshadows sectionalism, that tends to stultify the press and thereby reduce to a minimum the wholesome effect of national war-time propaganda and education in a broad sense.

A recent editorial in the JOURNAL brought out the fact that the several commissions appointed to investigate rates of second-class mail-matter reported unfavorably on the establishment of zone rates. In a recent letter to the Publishers' Advisory Board, Mr. Charles E. Hughes, who headed one of the investigating committees, makes this statement:

"I have no hesitation in saying that I regard the zone system of postal rates for newspapers and periodicals * * * as ill-advised. In my judgment the zone system for second-class mail matter is unjust to the publisher and unjust to the public. * * * Newspapers and magazines are admitted to the second-class postal rates on the well-established policy of encouraging the dissemination of intelligence; but a zone system is a barrier to this dissemination. * * * I hope that Congress will repeal the provision for the zone system which is decidedly a looking-backward and walking-backward measure."

The JOURNAL can add but a fervent "Amen" and express the hope that the members of the Southern Medical Association will intercede with their representatives in Congress until reason and equity prevail in this matter of second-class postal rates.

Correspondence

OFFICIAL NAMES OF LICENSED DRUGS

Editor, SOUTHERN MEDICAL JOURNAL,
Birmingham, Ala.

Dear Sir:

Professor Stieglitz, Chairman of the Subcommittee on Synthetic Drugs of the National Research Council, has asked me to send you the enclosed letter for publication.

On behalf of the Committee, he also urges that you adopt the Federal Trade Commission's recommendation to use the official name of the licensed drugs in connection with all written articles and advertisements, and if the proprietary brand name is to be used, to place this side by side with the official name.

The official names so far adopted by the Federal Trade Commission are:

Arsphenamine for the drug marketed as: Salvarsan, Diarsenol and Arsenobenzol, etc.

Neoarsphenamine for the drug marketed as: Neosalvarsan, Neodiarsenol and Novarsenobenzol, etc.

Barbital for the drug marketed as Veronal.

Barbital-Sodium for the drug marketed as Medinal and Veronal-Sodium.

Procaine for the drug marketed as Novocaine.

Procaine Nitrate for the drug marketed as Novocaine Nitrate.

Phenylcinchoninic Acid for the drug marketed as Atophan.

Yours truly,
W. A. PUCKNER, Secretary,
Council on Pharmacy and Chemistry,
American Medical Association.

PROCAINE AND NOVOCAINE IDENTICAL

To the Editor:

It appears that in certain quarters the attitude is taken that the local anesthetic sold as Procaine is not identical with that marketed as Novocaine. The Subcommittee on Synthetic Drugs of the National Research Council believes it important that this misunderstanding should be corrected and hence offers the following explanation:

The monohydrochlorid of para-amino-benzoyl-diethyl-amino-ethanol, which was formerly made in Germany by the Farbwerke, vorm. Meister, Lucius and Bruening, Hoechst A.M., and sold under the trademarked name Novocaine, is now manufactured in the United States. Under the provisions of the Trading with the Enemy Act, the Federal Trade Commission has taken over the patent that gave monopoly for the manufacture and sale of the local anesthetic to the German corporation, and has issued licenses to American concerns for the manufacture of the product. This license makes it a condition that the product first introduced under the proprietary name "Novocaine" shall be called Procaine, and that it shall in every way be the same as the article formerly obtained from Germany. To insure this identity with the German Novocaine, the Federal Trade Commission has submitted the product of each firm licensed to the A. M. A. Chemical Laboratory to establish its chemical identity and purity, and to the Cornell pharmacologist, Dr. R. A. Hatcher, to determine that it was not unduly toxic.

So far, the following firms have been licensed to manufacture and sell Procaine:

The Abbott Laboratories, Ravenswood, Chicago.
Farbwerke-Hoechst Company, New York, N. Y.
Rector Chemical Co., Inc., New York, N. Y.
Calco Chemical Company, Bound Brook, N. J.

Of these, the first three firms are offering their products for sale at this time, and have secured their admission to "New and Non-official Remedies" as brands of Procaine which comply with the new and non-official remedies standards.

While all firms are required to sell their product under the official name "Procaine," the Farbwerke-Hoechst Company is permitted to use the trade designation "Novocaine" in addition, since it holds the right to this designation by virtue of trademark registration.

In conclusion, Procaine is identical with the substance first introduced as Novocaine. In the interest of rational nomenclature, the first term should be used in prescriptions and scientific contributions. If it is deemed necessary to designate the product of a particular firm, this may be done by writing Procaine—Abbott, Procaine—Rector, or Procaine-Farbwerke, or Procaine (Novocaine brand).

Yours truly,
JULIUS STIEGLITZ, Chairman,
Subcommittee on Synthetic Drugs,
National Research Council.

FROM FRANCE

Headquarters, Aviation Instruction Center,
American Expeditionary Forces, France.

From—The Surgeon.
To—Editor, SOUTHERN MEDICAL JOURNAL,
Subject—Pellagra in France.

1. Am so busy these days inspecting troops for scabies that there's no time for pellagra. At sick call this morning if I had been in Waco, Tex., I should have said to several of my patients: "You have pellagra," but instead I ordered them put in the isolation ward, until my microscope revealed sarcoptes scabii, when I began an appropriate treatment for that much-to-be-seen and difficult-to-keep-clear-of ailment under the present conditions. Our troops are changed so often and occupy different sleeping quarters so much that we must depend upon constant vigilance to protect them from such conditions.

I would like the SOUTHERN MEDICAL JOURNAL sent to me all the time at my address as given below. Please send my bill to same address.

2. We are giving those Boches hell, and I'm sure e'er it's over Old Bill Hohenzollern and Alkali Ike Hapsburg will get what's coming to them, eh?

3. Through the JOURNAL, I wish you would say to the doctors that we who are fortunate enough to serve them in this struggle do it in the same American spirit as of old, knowing as we do that there are thousands of braver doctors than we, who are kept behind only by ties insurmountable, and obligations of family, etc., and who would be by our side except on that account. We send them and theirs our love. Tell them also that every mother's son of us here is doing his bit and is glad of the privilege. My nephew from Waco was recently here to visit me. He is a graduate of the University of Texas, and has just received a "brevet" in a French aviation school, and will soon be commissioned as a First Lieutenant in U.S.R. As I look all these fine young Americans in the face I think of Robert E. Lee and old Stonewall Jackson, and I see his example in effect through their splendid eyes and I feel like saying, "Oh, you Kaiser Bill, America is on your trail." But no doubt he knows it already.

4. When we have put the Kaiser into his final tail spin or "vree," as Frenchmen of the air say, I'll be again ready to take up our scientific work. My only science is now used in keeping our dear boys in shape to bring us a speedy victory and after a lasting peace.

Yours for a complete victory,

JOSEPH H. GRAVES,
First Lieutenant, M.R.C.,
Aviation Instruction Center,
Base Section No. 2, A.E.F., France.

Book Reviews

Medical War Manual No. 2. Authorized by the Secretary of War and Under the Supervision of the Surgeon-General and Council of National Defense. "Notes for Army Medical Officers." By Lieut.-Col. T. H. Goodwin, R.A.M.C., Author of "Notes for Medical Officers on Field Service in India" and "Field Service Notes for R.A.M.C.," with an Introduction by Surgeon-General William C. Gorgas, U.S.A. Philadelphia and New York: Lea & Febriger, 1918. Price, $1.00.

A concise and explicit presentation of most valuable information for medical officers concerning organization, medicine, surgery and sanitation.

Medical War Manual No. 4. Authorized by the Secretary of War and Under the Supervision of the Surgeon-General and the Council of National Defense. "Military Orthopaedic Surgery." Prepared by the Orthopaedic Council. Philadelphia and New York: Lea & Febriger, 1918. Price, $1.50.

This branch is one of the most important in the field of military surgery. The Manual is a useful little guide of that work as related to military surgery.

Medical War Manual No. 5. Authorized by the Secretary of War and Under the Supervision of the Surgeon-General and Council of National Defense. "Lessons from the Enemy: How Germany Cares for the War-Disabled." By John R. McDill, M.D., F.A.C.S., Major, M.R.C., U. S. Army. Philadelphia and New York: Lea & Febriger, 1918.

A narrative of a medico-military observer which portrays in a very interesting manner details of the medical and surgical methods of Germany's military machine. The author details much that can be of service to us as well as to our enemy.

Medical War Manual No. 6. Authorized by the Secretary of War and Under the Supervision of the Surgeon-General and Council of National Defense. "Laboratory Methods of the United States Army." Compiled by the Division of Infectious Diseases and Laboratories. Office of the Surgeon-General, War Department, Washington, D. C. Philadelphia and New York: Lea and Febriger, 1918. Price, $1.50.

"A collection of formulae and technical methods which will be useful in carrying out laboratory examinations which officers of the Medical Corps will be called upon to perform in stationary and field laboratories."

Clinical Lectures on Infant Feeding. Boston Methods, by Lewis Webb Hill, M.D., Children's Hospital, Boston. Chicago Methods, by Jesse Robert Gerstley, M.D., Michael Reese Hospital, Chicago. 367 pages. Philadelphia and London: W. B. Saunders Co., 1917. Cloth, $2.75.

As the preface discloses, this volume represents a departure in post-graduate teaching. The plan was conceived of having post-graduate instruction in pediatrics carried to the physicians of North Carolina and Drs. Hill and Gerstley were engaged to give the courses of lectures. One made a circuit of half the State while the other made the circuit of the other half, giving daily clinics and lectures and completing the circuit, each in six days. One gave methods as seen and practiced by him in Boston; the other as viewed by a pediatrician of Chicago.

The subject is well covered by both lecturers in a practical, helpful way. Differences will be disclosed as should be true in a subject of as diverse views and practice as is that of infant feeding; and this should be a recommendation to the thoughtful general practitioner. The book and the plan are to be commended.

Infant Feeding. By Clifford G. Grulee, A.M., M.D., Assistant Professor of Pediatrics, Rush Medical College, Chicago. Third Edition, 326 pages, illustrated. Thoroughly Revised. Philadelphia and London: W. B. Saunders Co., 1917. Cloth, $3.25.

This is a systematic treatise on the subject of infant feeding, giving the physiology and anatomy of the digestive organs and covering the whole field in a satisfactory manner. Normal breast feeding, artificial feeding and the disturbances incident thereto, and feeding in all the various infantile disorders, are dealt with. The subject is thoroughly and ably covered.

A Hand Book on Antiseptics. By Henry Drysdale Dakin, D.Sc., F.I.C., F.R.S., and Edward Kellogg Dunham, M.D., Major, M.O.R.C., U. S. Army; Emeritus Professor of Pathology, University and Bellevue Hospital Medical College, New York City. New York: The Macmillan Co., 1918. Price, $1.25.

A rather complete presentation of the various groups of antiseptics; their modes of action and comparative bactericidal efficiency.

The chemistry of the chlorine group of antiseptics is well described with especial reference to the preparation of the drugs and their use in war surgery and in the sterilization of water.

American Addresses. By Sir Berkley Moynihan, M.S., F.R.C.S. Philadelphia: W. B. Saunders Co., 1917.

This volume consists of five addresses given by Sir Berkley Moynihan while on a visit to the United States in November, 1917. The principal subjects treated in these papers are: "The Causes of the War," "Gunshot Wounds and Their Treatment," "Wounds of the Knee Joints," "On Injuries to the Peripheral Nerves and Their Treatment," and "Gunshot Wounds of the Lungs and Pleura." They are both scientific and delightfully written.

A Treatise on Cystoscopy and Urethroscopy. By Dr. Georges Luys, Former Interne, Hospital of Paris; Former Assistant in the Department of Urinary

Diseases at the Lariboisiere Hospital; Laureate of the Faculty of the Academy of Medicine. Translated and Edited with Additions by Abr. L. Wolbarst, M.D., Cystoscopist, Beth Israel Hospital; Consulting Urologist, Central Islip and Manhattan State Hospitals; Genito-Urinary Surgeon, West Side German Dispensary and Hospital; Author of "Gonorrhea in the Male," etc. 386 pages, with 217 figures in the text and 24 chromotypographic plates outside the text, including 76 drawings from original water colors. St. Louis: C. V. Mosby Co., 1918. Cloth, $7.50.

The reviewer has seen no work on cystoscopy which has aroused his admiration and interest as has this wonderful translation from the French. The historical section, the comparison of the various instruments and methods of cystoscopy and endoscopy, the innumerable colored plates executed with a rare skill so seldom found, the many clear cuts of pathological bladders and urethras, and the detailed descriptions of abnormalities so often hurriedly passed over in general works on urology, place this book in a class by itself. We have seen nothing to compare with it.

It does not attempt to deal with the entire urinary tract and hence does not even contain a description of any of the functional tests of the kidney. It limits its field to urethoscopy and cystoscopy, together with ureteral catheterization. What the author has attempted he has accomplished in a way to arouse the admiration of the reader at every turn. In reproducing this work in English, Dr. Wolbarst has rendered a great service to American urology.

The Practical Medical Series. Volume VIII, Pharmacology and Therapeutics. Edited by Barnard Fantus, M.D., Associate Professor of Medicine, Subdepartment of Therapeutics, Rush Medical College, Chicago, Ill., and Preventive Medicine, edited by Wm. A. Evans, M.D., LL.D., Ph.D., Professor of Preventive Medicine, Northwestern University Medical School. 367 pages. Chicago: The Year Book Publishers, 1918. $1.50. Complete series of ten volumes, $10.00.

While a book of this size precludes a discussion of all drugs and therapeutic agents, the value of the book rests mainly on the suggestions which the authors make as to combining drugs, synergistic action, mode of administration, and, no less important to the patient, relative cost of drugs having similar action. The first section of the book—that dealing with pharmacology and therapeutics—is decidedly practical in the treatment of the various agents at the doctor's disposal, and makes a strong appeal to the general practitioner. The latter part—that dealing with preventive medicine—makes its most patent plea to the sanitarian, the health officer and to the industrial surgeon. In addition to a discussion of the local question of sanitation, the author reviews in a very satisfactory way the results of the present war as regards death rates, prophylaxis and disease control.

The Essentials of Materia Medica and Therapeutics. For Nurses. By John Foote, M.D., Assistant Professor of Therapeutics and Materia Medica, Georgetown University School of Medicine. Third Edition; 310 pages. Philadelphia and London: J. B. Lippincott Co., 1918. Cloth, $1.75.

To cover the subject in a suitably brief text for nurses is indeed a difficult task, as the choice and classification of material must necessarily include only the important factors.

Here the classification is simple and well executed. However, the choice of material, in the reviewer's opinion, could be somewhat improved upon. There seems to be a tendency to digress to allied topics, and for a text of this kind a rather larger portion than necessary is intended for reference. The "Reference List of Drugs" alone contains seventy-eight pages, which is almost one-third of the reading matter in the book. In the formulatory for practical use, in some instances the author employs the apothecary, and in others the metric, system. The efficiency of the formulary would be considerably improved by expressing quantities in both systems in adjoining columns.

Materia Medica: Pharmacology, Therapeutics, Prescription Writing. For students and Practitioners. By Walter A. Bastedo, Ph.G., M.D., Assistant Professor of Clinical Medicine, Columbia University. 2nd Edition Reset. 654 pages. W. B. Saunders Co., 1918. Cloth, $4.00.

The author exercises fine discretion in selecting and including the essential and in omitting the less important. The thoroughly modern discussion on digitalis and its group deserves especial commendation. The cuts of diagrams and photos are more numerous than ordinary in texts of this kind and lend added interest and illumination to the subjects under discussion. The thoroughness and completeness is well illustrated by the somewhat extended index, forty-eight pages of small type. This feature, which in some text-books is carelessly done, is carefully executed and adds greatly to value of the book as a reference work.

A Practical Text-Book of Infection, Immunity and Special Therapy, with special reference to immunologic technic. By John A. Kolmer, M.D., Dr.P.H., M.Sc., Assistant Professor of Experimental Pathology, University of Pennsylvania, with an introduction by Allen J. Smith, M.D., Professor of Pathology, University of Pennsylvania. Second Edition, Thoroughly Revised. Octavo of 978 pages with 147 original illustrations, 46 in colors. Philadelphia and London: W. B. Saunders Co., 1917. Cloth, $7.00; half morocco, $8.50.

In discussing this book, the writer is reminded of Bran, who, in reviewing a work, said that "the only way it could be made better would be by making it bigger." Dr. Kolmer takes up every phase of infection and immunity, and the literary style of the book would compare well with Osler's "Practice of Medicine."

The first chapter is devoted to general technique, which explains in a simple manner every detail of laboratory work, even the care and operation of the centrifugal machine being given. The chapter on immunity and the theories of immunity is very interestingly and beautifully written. This chapter is given in such a way that one having once read it, remembers it forever; and the writer demonstrates that he is not only a technician, but also one of the greatest teachers of our time.

The opsonic theory of Wright and Douglass and the methods of obtaining the opsonic index are clearly defined. A chapter is devoted to vaccines and the effects of vaccines and auto-toxins. The Schick test is taken up in detail, and Dr. Kolmer explains the necessity of applying this test in localities in which diphtheria is found. The Abderhalden test and all of the precipitations and agglutination tests are described, and the proper value placed upon each, including the technique of type determinations in pneumonia.

Complement-fixation tests are allotted a hundred pages or more, and an attempt is made to standardize the reagents and technique. The last chapter of the book is devoted to chemo-therapy. Part five, which is treated more as an addition to the original volume, takes up experimental therapy and immunity.

After looking the book over the reviewer wonders how anyone practicing medicine can get along without having studied it. Relatively few physicians can give a clear description of any of the theories of immunity or chemo-therapy. Yet we all use drugs, vaccines and serums. After reading this book we will know that a vaccine acts as an antigen; and being injected into a living organism produces an amboceptor which unites with its specific antigen in the presence of complement. We will also learn that the anti-toxin, which is contained in the serum which we give in diphtheria, unites directly with, and neutralizes, the toxin of the disease; and that complement is not necessary for this reaction, the anti-body being an anti-body of the first order. We will probably infer from this that the reason why a gonococcus serum does not work so well is because we are dealing with an anti-body of the third order; and since the immune serum does not carry its own complement, we depend upon the patient to supply this necessary substance which he or she in numerous cases does not possess.

This book explains all of these mysteries, and if heeded would enable us to practice medicine in a much more scientific and intelligent manner than is at present the case.

Kirk's Handbook of Physiology. Revised and rewritten. By Charles Green, A.M., Ph.D., Professor of Physiology and Pharmacology, University of Missouri. North American Edition. 509 illustrations, including many in colors. 970 pages. New York: William Wood & Co., 1917. Cloth, $3.75.

This book is so well known that praise would be presumption and criticism a crime. All that can be said of the work is that it is just as good as ever, and has

been revised and brought up to our modern standards of thought by Dr. Charles Wilson Green, the very able Professor of Physiology and Pharmacology at the University of Missouri.

One chapter which deserves special mention is that on the requisites for normal diet. In it Dr. Green gives a very clear idea of a perfectly balanced diet. In addition to this he takes up the supplemental diet, especially the vatamines, and shows that in addition to a diet based upon coloric value, we must have another substance to which Funk appplied the name vitamine. Attention is called to this fact for the reason that the value of the vitamines is not clearly understood by the average practitioner of medicine. Recently at a meeting of one of our largest Southern medical societies the question of their function and value was discussed at length; and even though several prominent gastro-enterologists were present, a clear and definite description of their function was never given.

The chapter on ductless glands and their effect on the metabolism is complete and will furnish interesting and instructive reading to everyone practicing medicine.

Taken as a whole, the book may be said to be a necessary part of every physician or student's library, and one which is indispensable to anyone practicing modern scientific medicine.

What Men Live By and Other Stories. By Leo Tolstoi. Boston: The Stratford Co., 1918. Boards, 25 cents.

"Sometimes short stories are brought together like parcels in a basket. Sometimes they grow together like blossoms on a bush. Then, of course, they really belong to one another, because they have the same life," says Henry Van Dyke in his preface to the "Blue Flower;" and this is a truth which every publisher of short stories might well keep in mind. The source of the life may be one of three things: character, setting or theme. Often we find a book of stories centered around one character or group of characters. In this type of book it is easy to find the connecting link. It is more difficult clearly to maintain this connection in stories that center around setting. The real task comes, though, when the theme alone makes for unity.

In "What Men Live By and Other Stories" the publisher has been unusually successful. The whole book is the expression of the simple religion of a great, but simple man; a religion stripped of all form, and which seeks expression in everyday life—its cornerstone being the love of mankind, its apex being a deep respect for the religions of other men.

"What Men Live By," the story from which the volume takes its title, is perhaps Tolstoi's best known short story. It is the story of an angel who is sent to earth by God to learn three lessons: what dwells in man, what is not given to man, and what men live by. It is a beautiful story of the far-seeing fatherhood of God and of charity among men. When the angel has learned the lessons he turns to Simon the shoemaker, with whom he has lived, and says, "All men live not by the thought they spend on their own welfare, but because love exists in man."

"Three Questions" is the story of a king who seeks guidance from a hermit. He receives such sound advice that it were well had we each a copy of the hermit's reply where it could be seen every hour of the day.

"The Coffee-House of Surat" and "How Much Land Does a Man Need?" are the other two stories contained in this little volume. The first is an intense argument among men of all faiths as to which is the true faith. The Chinaman, the student of Confucius, compares God to the sun and the different religions to its rays. "Therefore," he says, "let him who sees the sun's whole light filling the world refrain from blaming or despising the superstitious man who, in his own idol, sees one ray of that light. Let him not despise even the unbeliever, who is blind and cannot see at all."

"How Much Land Does a Man Need?" the last story, sets forth the futility of sacrificing life for earthly possessions. Pahom had, as the Chief said, gained much land, but six feet from his head to his heels was all he could use.

Stories of the Steppe. By Maxim Gorki. Boston: The Stratford Company, 1918. Boards, 25 cents.

The way of the translator is hard. He must, like the doctrine of transubstantiation, convert one substance into another substance palatable enough and not too unfamiliar to be consumed with relish by the "reading public" into whose language he is translating. It is questionable whether the innermost spirit of the literature of one land and people is ever wholly understood by another land and people, be the translator never so successful in his task.

Of all foreign literature Russian fiction has perhaps been most successfully translated into English; and yet what American reading the great Russians in English has not occasionally wondered secretly just what the characters were doing and why they were doing it? The efforts of the translators to unscrew the inscrutable Slavic soul with English as the tool have often left much to be desired. The phrase, "done into English," is frequently only too true.

How delightful it is, therefore, to encounter a perfect, soul-satisfying translation in the shape of "Stories of the Steppe," by Maxim Gorki, translated by Henry T. Schnittkind and Isaac Goldberg, with an introduction by the former. All gratitude and honor to these masters of two languages whose colorful, winged words carry the reader over the mournful Russian Steppe into the heart of Gorki!

The three stories so happily chosen for this volume are "Makkar Chudra," "Because of Monotony" and "The Man Who Could Not Die." The first, a gypsy tale, dark and fiercely glowing, might be the very words to the music of Listz's Second Hungarian Rhapsody, so full is it of wild ecstacy and pain. The last also is a gypsy legend of "what happened many thousand of years ago" to Larra, whom God punished for overweening pride.

The second tale, "Because of Monotony," is the bright particular story of the group, one of the most poignant and pitiful short stories ever written. It is quite impossible to convey in a brief critique the depth, power and realism of its tragedy—a woman's tragedy. It offers no comment, presents no philosophy, simply and with dramatic force tells a sorry tale, ringing with cruel laughter.

As an earnest of the singing warmth of Mr. Schnittkind's English, as well as a very adequate criticism of Gorki's three stories, we quote a passage from his introduction:

"Maxim Gorki, the Bitter Voice of Russia, can tell fairy tales whose coloring has all the richness of Oriental twilights, and whose cadences are garlands woven of sea-spray and wind-blossoms. . . . He who has no love for music had better leave these stories alone, as they will have no charm for him. . . . But those who have the capacity for enjoying the silent music of the night, the barely audible purling of waves in the distance, the soft pit-a-pat of the wind-dance on the prairie, will be charmed by those stories as they have rarely been charmed in their waking hours."

Southern Medical News

ALABAMA

Dr. W. W. Dinsmore, formerly State Prison Inspector, has accepted a position as Assistant Medical Director of the Travelers Insurance Company. He will make his headquarters in the home office at Hartford, Conn.

Dr. H. C. Crelly, Birmingham, has been appointed City Physician to succeed Dr. Cecil Gaston, who has been given leave of absence for the duration of the war.

Dr. Glenn Andrew, Montgomery, has been appointed to succeed Dr. W. W. Dinsmore, resigned, as State Prison Inspector.

The Jefferson County Board of Health has begun an active and extensive health survey of the County and surrounding vicinity.

Deaths

Dr. J. F. Walker, Anniston, aged 71, died at his home during July.

Dr. W. H. Watson, Dothan, died at his home during July.

ARKANSAS

Dr. J. G. Cullins, Junction City, appointed to the U. S. Public Health Service, has been assigned to Little Rock for duty.

Homer L. Huntington has been appointed by the U. S. Public Health Service as milk expert and will have entire supervision of milk depots and ice cream factories in Little Rock.

The Benton County Medical Society held its regular session at Rogers on July 10.

Dr. C. C. Pierce, U. S. Public Health Service, has been transferred from Little Rock, where he has been engaged in a sanitary survey for the past year.

Dr. G. S. Brown, Conway, has been appointed a trustee of the Tuberculosis Sanitarium at Booneville.

DISTRICT OF COLUMBIA

The medical society of the District of Columbia has been incorporated by a recent act of the Senate.

Dr. Francis Mahoney has been succeeded as City Health Officer of Boston by Dr. William C. Woodward, Health Officer of the District. Dr. Woodward assumed his duties on August 1.

Dr. Thomas Kelly has been appointed to succeed Dr. Isaac Stone as Professor of Gynecology in the Georgetown University.

Drs. James M. Moser and John A. Foote have been appointed Associate Professors in Pediatrics in Georgetown University.

Assistant Health Officer Fowler assures the public that there is no immediate danger to Washington on account of the few cases of typhoid that have been reported.

FLORIDA

A conference of the health officers of the State was held in Jacksonville August 1-3.

Dr. H. Mason Smith has been succeeded by Dr. William M. Bevis, Chattahoochee, as Superintendent of the Florida Hospital for the Insane.

Dr. Van H. Gwinn, Jacksonville, has recently been appointed Assistant City Health Officer.

Dr. Peter W. Butler, Leesburg, is convalescent at his home following a severe illness.

At a recent meeting of the City Commission at Jacksonville the sum of $5,000 was voted to the Health Department for the work being done in connection with venereal diseases.

Dr. C. T. Young, Plant City, has been appointed a member of the Hillsborough County Exemption Board. Dr. J. J. Boyett, West Tampa, has resigned.

GEORGIA

The Chattahoochee Valley Medical and Surgical Association held its eighteenth annual session at Warm Springs July 9-11. An excellent program was presented and the meeting was, as usual, most enjoyable and successful.

Dr. Henry Donaldson, Atlanta, is convalescent after a prolonged illness following an automobile accident some three months ago.

The State Legislature has set aside the sum of $60,000 for the use of the State Board of Health. This is double the sum for 1916 and within $10,000 of the original sum requested.

Georgia now has the "eugenic marriage law," which requires a man to present a certificate of health before a license can be issued.

The Medical Association of Georgia and the Journal of the Association have moved their headquarters from Augusta to Atlanta.

The Laurens County Medical Society met in annual session with the Twelfth District Medical Society at Dublin on July 10. The following officers were elected following a barbecue: President, Dr. John K. Malloy, Milan; Vice-Presidents, Dr. C. F. Walker, Swainsboro, and Dr. William R. Brigham, Dublin; Secretary-Treasurer, Dr. J. H. Moore, Dublin.

Dr. J. P. Bowdoib, Assistant Surgeon, U. S. Public Health Service, has been in Athens for the purpose of establishing three venereal clinics.

KENTUCKY

Dr. Robert Ferguson, Trenton, is suffering from an attack of apoplexy sustained during July.

Dr. Claude Rankin has resigned as City Health Officer of Lexington.

The legal status of the State Health Board question is undetermined and at present there are two boards in existence, although an injunction has been issued against the new one performing any duties pertaining thereto. Dr. A. D. Wilmuth, Louisville, has been elected President of the new Health Board.

Dr. L. T. Hood, formerly of Nebraska, has removed to Ashland, where he will engage in the general practice of medicine.

Dr. I. D. Winton, Sturgis, is critically ill at his home following a complication of diseases.

The nineteenth quarterly session of the Kentucky Midland Society was held in Lexington at the Bluegrass Sanitarium during July.

Dr. William Parsons, Paducah, has removed to Ashland, where he will enter the practice of medicine.

Dr. Anna Veech has been given leave of absence as School Physician under the City Health Department, Lexington, for services abroad.

Deaths

Dr. John A. Lewis, Georgetown, aged 74, died at his home during July.

LOUISIANA

Dr. W. T. Patton, New Orleans, in charge of the Ear, Nose and Throat Department of Base Hospital Unit No. 102, has been called to service. This Unit was organized especially to go to Italy and was to move about August 1. Dr. Patton was Secretary of the Section on Eye, Ear, Nose and Throat of the Southern Medical Association.

The State Board of Health has arranged to show films throughout the State in order to bring before the people some very important war health work that is going on and must be done.

Deaths

Dr. Harry Jerwick, interne at the Charity Hospital, died from typhoid fever during July.

Dr. A. B. Gaudet, New Orleans, aged 44, after a short illness, died at his home during July.

Dr. Samuel Logan, New Orleans, aged 42, after a prolonged illness, died at his home during July.

Dr. W. H. Williams, Alexandria, died of heart disease at his home during July.

MARYLAND

On July 17, at Towson, the thirty-ninth meeting of the Maryland Psychiatric Society was held in conjunction with the Baltimore County Medical Association.

A campaign has been started in Baltimore to secure 510 women to enroll in the Army School of Nursing. The first meeting was held July 25.

Dr. Brooks I. Jamison, Emmitsburg, has recovered from injuries received in an automobile accident some time ago and has returned to his home.

Dr. Arthur L. Fehsenfeld, Baltimore, is recuperating following an operation for appendicitis.

Plans have been approved by Congress for the addition of new buildings at the Marine Hospital in Baltimore.

Dr. Katherine T. Jones, Fullerton, has been recently appointed Assistant Superintendent of the Orthopedic Hospital, Philadelphia.

Dr. John R. Oliver, of the Henry Phipps Psychiatry Clinic, has been appointed as Examining Physician for the courts in connection with criminal work, etc.

Dr. Howard Bratton, Elkton, is serving as Physician to the Cecil County Prison.

A gypsy camp on the outskirts of North East, Cecil County, has been placed under quarantine on account of the presence of typhus fever. Dr. C. Hampton Jones, Baltimore, Chief of the State Bureau of Communicable Disease, is in charge.

Dr. Richard Follis, Baltimore, has succeeded Dr. Nathan Gorter, deceased, as Medical Adviser of the Maryland District draft board.

Dr. H. S. Mitchell, M.R.C., U.S.A., has been succeeded as Superintendent of the Franklin Square Hospital by Dr. Fred Robertson, of Mullens, W. Va.

MISSISSIPPI

Deaths

Dr. Chas. M. Taylor, Corinth, aged 52, died at the Baptist Memorial Hospital, Memphis, July 19.

(Continued on page 26)

you will always find

Satisfaction and Economy in the use of our Aseptic Ampules:—

Satisfaction because of the purity of the chemicals, accuracy of dosage and complete sterility of the solutions or suspensions as well as of the ampules *per se*

Economy because even with our Mercury Salicylate you can use your regular hypodermic syringe—thus saving an investment in a special syringe and needle for the denser suspensions

Our latest ampule list is yours for the asking

SINCE 1860 Sharp & Dohme
CAREFUL CONSCIENTIOUS CHEMISTS

A TRUE LINE

In the present uncertain state of the drug market, with the demand for many items far exceeding the supply, the market is being flooded with crude drugs and chemicals of inferior quality, many of which are being offered at very favorable prices.

For the protection of American Physicians, crudes and chemicals entering into the manufacture of P-M Co. Pharmaceuticals, are secured from reliable sources ONLY and are subjected to the closest scrutiny by our chemists. Constant analyses and assays protect you, Doctor, against untrustworthy ingredients when you use the pharmaceuticals of

A TRUE LINE

PITMAN-MOORE COMPANY
PHARMACEUTICAL & BIOLOGICAL CHEMISTS
INDIANAPOLIS

Patronize our advertisers—mention the Journal when you write them.

(Continued from page 600)

MISSOURI

The Missouri State Board of Health has withdrawn recognition of the St. Louis College of Physicians and Surgeons.

Dr. T. H. Wilcoxon, Bowling Green; Dr. T. A. Son, Bonne Terre, and Dr. E. T. North, St. Louis, have been reappointed as members of the State Board of Health for a period of four years.

At a recent civic meeting at Joplin the Public Health Association of Joplin was organized.

The St. Louis Medical Society has started an investigation to ascertain the names of enemy aliens that are members of the Society.

The appointments at the General Hospital, Kansas City, have been made and it is noted that there are a number of assistants omitted and the physicians are older men than in previous years.

Dr. Frederick R. Riley has assumed his duties as Superintendent of the State Hospital.

The Medical Department of the Township Defense Committee held a most interesting public meeting at Marshall during July.

The regular monthly meeting of the Madison County Medical Society was held in St. Louis.

Dr. Porter Williams, Bunceton, has been reinstated as Superintendent of the State Hospital for the Insane, St. Joseph.

Dr. Herbert Vanorden has been appointed Physician for the Fire Department at Kansas City.

All plans have been completed whereby St. Louis will have a first-class hospital for Negroes.

NORTH CAROLINA

Dr. E. M. McCoy has been elected City Physician by the City Commissioners of Charlotte.

Dr. W. T. Rainey, Badin, was seriously hurt early in July in an automobile accident while motoring through the mountains of North Carolina. Dr. Rainey was married the latter part of June to Miss Merle Weaver, of Greensboro, and they were on a motor wedding trip. Mrs. Rainey was not so seriously hurt.

OKLAHOMA

Dr. J. H. Florence, formerly Medical Director, Great Southern Life Insurance Company, Dallas, Tex., is the Medical Director and Vice-President of the Atlas Insurance Company, Tulsa. He will make his future home in Tulsa.

The Garfield County Medical Society held its regular meeting in Enid on July 7.

Dr. W. D. Dawson, recently of Dallas, has moved to Henrietta, and has taken over the practice of Dr. H. E. Breese.

Dr. H. A. Lile, Cherokee, and Dr. L. T. Lancaster have been chosen as Chairman and Secretary, respectively, of the Alfalfa County Medical Defense Council.

Tulsa and Shawnee have begun the fourth health survey of the season for the prevention of tuberculosis.

Dr. A. T. Dobson, Rocky, has assumed the practice of Dr. Leverton, now of the M.R.C., U. S. Army.

The Okfuskee County Medical Society held a meeting in Oklahoma City during July.

Deaths

Dr. S. P. Rawls, Altus, aged 64, died at his home on June 20.

Dr. W. E. Haygood, Bison, aged 45, was accidentally killed by an explosion on July 8.

SOUTH CAROLINA

A state-wide public health and sanitation campaign is being conducted under the direction of the State Board of Health and the Council of National Defense.

Dr. James F. David has been elected City Health Officer of Bennettsville.

Deaths

Dr. Claude Evans King, Mayesville, died at his home July 17.

(Continued on page 28)

Let Us Send YOU This Book, Doctor

We believe that if you will read and consider its contents in the light of your professional knowledge and experience, you will instantly recognize the scientific merit of the Philo Burt Method for relieving and correcting spinal curvature, with its sequelæ, and that you will avail yourself of the first opportunity to conclusively demonstrate its value.

It has been our privilege to co-operate with thousands of practitioners and we will gladly refer you to some of your own contemporaries. Or, we will accept the case from you and assume full responsibility — just as you prefer.

30 Days Trial

We will make a Philo Burt spinal appliance to measure to your own order for any patient and refund its entire cost if at the end of thirty days you find it does not meet the requirements or if you or your patients are dissatisfied.

More Than 30,000 Cases Successfully Treated

Send a postal today for this interesting free book and a portfolio of "Letters in Evidence" from physicians who tell their experience with this wonderful appliance.

PHILO BURT COMPANY, 58K Odd Fellows Bldg., Jamestown, N. Y.

"Sick Headache"

—and other headaches—

are usually relieved more or less promptly as you remove their cause. In the meantime—

K-Y ANALGESIC

locally "rubbed in," will usually afford comfort without blistering or soiling.

Gives Nature's Corrective Forces a Chance

No fat or grease. Samples and literature on request. Water-soluble. Collapsible tubes, druggists, 50c.

Johnson & Johnson

VAN HORN & SAWTELL DEPARTMENT
15 & 17 E. 40TH STREET, NEW YORK, U.S.A.

So many cases of

Pruritus, Chafings, and Irritations

are relieved by applying

K-Y Lubricating Jelly

that we feel we owe it to our patrons to direct their attention to the usefulness of this product as a local application, *as well as* for surgical lubrication.

No claim is made that K-Y Lubricating Jelly will act with equal efficiency in every case; but you will secure such excellent results in the majority of instances that we believe you will continue its use as a matter of course.

NO GREASE TO SOIL THE CLOTHING!

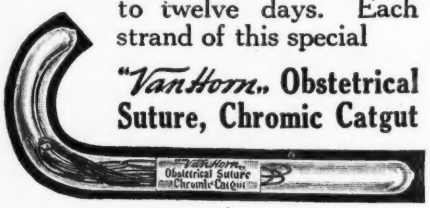
Collapsible tubes, 25c. Samples on request.

Johnson & Johnson

VAN HORN & SAWTELL DEPARTMENT
15 & 17 E. 40TH STREET, NEW YORK, U.S.A.

IN THAT CONFINEMENT TEAR

If you favor immediate repair, use our especially chromicized catgut prepared to hold seven to twelve days. Each strand of this special



"Van Horn" Obstetrical Suture, Chromic Catgut

is threaded on a suitable needle, ready for instant use. Indispensable for your surgical bag. One tube in each box. Price, 25 cents each; $3.00 per dozen tubes. No samples.

OBTAINABLE FROM YOUR DEALER

Johnson & Johnson

VAN HORN & SAWTELL DEPARTMENT
15 & 17 E. 40TH STREET, NEW YORK, U.S.A.

Hand Disinfection

can be easily and conveniently accomplished by the use of

SYNOL SOAP

This efficient liquid soap enables the physician and surgeon to cleanse and disinfect the hands with gratifying freedom from the irritating effects of caustic soaps and antiseptics. It is particularly serviceable to those who have to cleanse the hands many times each day. Invaluable in the office, operating room and sick chamber.

ANTISEPTIC—
CLEANSING—
DEODORANT

Johnson & Johnson

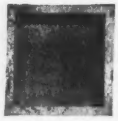
New Brunswick, N. J. U. S. A.

RADIUM

STANDARD CHEMICAL CO.

Radium Element Content and Delivery Guaranteed

Prepared, of desired concentration (purity), in glazed placques and tubes of standard and special designs, for superficial and cavity applications.



10 Milligram half strength Flat Applicato.—(Glazed face and Gold back, patented.)

U.S. Bureau of Standards Measurement.

Interesting and helpful literature on Radium and its therapeutic uses will be sent to physicians upon request.

25, 50 and 100 Milligram Tube Applicator

Radium Chemical Company

General Offices and Laboratories

Astor Trust Bldg. New York — **Pittsburgh, Pa.** — Butler Bldg. San Francisco

(Continued from page 26)

TENNESSEE

A service flag with seventy-nine stars was dedicated by the Memphis and Shelby County Medical Society the middle of July. Dr. J. L. Andrews made the presentation address, and the President of the Society, Dr. John L. Jelks, the acceptance address.

A contagious disease section, a maternity ward and a children's department are the improvements planned for Knoxville General Hospital.

Dr. R. E. Fort has resigned from the Bureau of Vital Statistics of the State Board of Health.

The Shelby County Tuberculosis Sanatorium, to be known as the Oakville Memorial Sanatorium, will be located on a 159-acre tract recently purchased near Oakville.

The Memphis women are planning for a drive for $56,000 to be used by Base Hospital No. 57, the Memphis unit.

TEXAS

Dr. J. H. Florence, Dallas, for some years Medical Director of the Great Southern Life Insurance Co., has severed his connection with that Company to become Medical Director and Vice-President of the Atlas Insurance Co., a new company with headquarters at Tulsa, Okla.

Dr. T. B. Fisher, Dallas, has been appointed Medical Director of the Great Southern Life Insurance Co. Dr. W. E. Crow has been named Associate Medical Director.

Dr. C. F. Seafers, Port Arthur, has been appointed a member of the local exemption board, vice Dr. M. Swearingen, who has been commissioned in the Medical Reserve Corps, U. S. Army.

Dr. R. C. Ferguson, Oak Cliff, has resigned as a member of the Exemption Board to enter the Medical Reserve Corps, U. S. Army.

The State Board of Health announces the appointment of Dr. H. B. Henry, Jacksonville, and Dr. A. P. Harrison as Field Directors of the Bureau of Rural Sanitation.

(Continued on page 30)

Laboratory of Clinical Pathology

1250 Bank of Commerce & Trust Building

MEMPHIS, TENNESSEE

UNDER CHARGE OF

Dr. William Krauss and Dr. James S. Fleming

Everything that can be done in a clinical laboratory

Customary Prices

Containers, culture and serum tubes sent on application

THE problem of artificially feeding infants during the heated term is complicated by the danger of disease transmission through fresh cow's milk of questionable origin.

Borden's Eagle Brand Condensed Milk is prepared under strictly sanitary conditions from selected high-grade cow's milk and sugar. Its purity and cleanliness can be safely relied upon.

Samples, analysis and literature will be mailed on receipt of professional card.

BORDEN'S CONDENSED MILK CO.
New York

Every-Day Bran Food

Pettijohn's is a morning dish which everybody likes.

Wheat flakes and oat flakes are combined to yield a most delightful flavor.

The 20 per cent bran is in flake form, hidden in the flakes. It is inconspicuous, yet it is efficient.

Doctors told us they wanted a bran dish which people would continue. Now thousands of doctors say that Pettijohn's meets that requirement well.

It is now, we believe, more largely used than any other bran food.

Pettijohn's

A Flaked Cereal Dainty

80% Wheat Product Including the Bran — 20% Oats

A breakfast dainty whose flavory flakes hide 20 per cent unground bran.

Pettijohn's Flour — 75 per cent Government Standard flour with 25 per cent bran flakes. Use like Graham flour in any recipe.

Both sold in packages only.

(1941)

ELECTRO-THERAPY
IN THE ABSTRACT

By Omar T. Cruikshank, M. D.

Dr. Albert C. Geyser has stated:

"From actual experience, I am willing to go on record with the statement that I am almost convinced that every stage of pulmonary tuberculosis in the first stage is curable by the D'Arsonval current."

A great number of well known physicians give their experiences in the above work.

Copies gladly mailed to physicians interested.

Gentlemen:

A copy of ELECTRO-THERAPY would be appreciated, this request placing me under no obligation.

Name .....

Address .....

THOMPSON-PLASTER CO., INC.,
LEESBURG, VA.

(Continued from page 28)

A new law has been passed in Texas which prohibits the advertising of remedies for venereal diseases and advertisements in which such diseases are mentioned or which direct the attention of the public to an office or person where such medicine or treatment may be obtained. A fine is provided for the publishing, delivering or distributing of such advertisements, as well as for those who permit placards or posters containing such information to remain on buildings controlled by them. The law is distinctly aimed at the male specialists and remedies for male diseases.—Journal A. M. A.

Deaths

Dr. A. P. Sutherland, Amatillo, died in Wisconsin the latter part of June.

Dr. William Hale, Sr., Dallas, aged 68, died at his home the latter part of June.

Dr. W. H. Kinslow, Ector, died at the home of his son July 14.

Dr. R. L. Kurth, Dallas, died at Kerrville July 17th.

Dr. T. V. Bishop, Springfield, aged 50, died at a sanitarium in Paris July 8.

VIRGINIA

Dr. W. A. Brumfield, Richmond, of the State Board of Health, has been appointed Acting Assistant Surgeon, U. S. Public Health Service, and will have charge of the venereal disease campaign with headquarters at Richmond.

Dr. Robert L. Wilkins, Alexandria, was recently reelected State Commander Knights of Maccabees, and Dr. Howard Urbach, Richmond, State Physician.

The Southwestern Virginia Medical Society has discontinued its meetings until after the war.

Deaths

Dr. Christopher Tompkins, Richmond, aged 70, died at his home July 20. He was formerly Dean of the Medical College of Virginia and saw service in the Confederate Army.

(Continued on page 32)

Laboratories of Drs. Bunce and Landham
ATLANTA, GEORGIA

"The Standard Southern Clinical Laboratories"

Allen H. Bunce, A.B., M.D., and J. W. Landham, M.D., Directors.

WASSERMANN REACTIONS. These are performed each day in the week after having carried out careful preliminary titrations of all materials to be used in the tests. All reagents used are prepared and standardized in our own laboratory, thus insuring their freshness and reliability. These things enable us to give prompt and accurate reports on all specimens submitted.

AUTOGENOUS VACCINES. All cultures for vaccines are grown both aërobically and anaërobically as a routine procedure. Vaccines are supplied only in sealed ampules, thus insuring their freedom from contamination during the course of treatment.

TISSUES. Upon request we make frozen sections of tissues and telegraph report on the same day the specimens are received. However, we prefer to embed the tissues in celloidin or paraffin, which requires from three to five days, before giving a final report. Both a preliminary report from frozen sections and a final report from embedded sections may be had upon request. Slides of all tissues examined are kept as a part of our permanent records.

X-Ray treatments and diagnosis including studies of the gastro-intestinal tract following the administration of the opaque meal.

We furnish bleeding tubes, culture media, and all other necessary containers free upon request.

Address

Laboratories of Drs. Bunce and Landham, Healey Building, Atlanta, Ga

Laboratories
and
Laboratory Methods

When laboratories and laboratory methods are being discussed by scientific men who know what they are talking about, The Cutter Laboratory of Berkeley, California, has more than "honorable mention."

It stands out as "The Laboratory That Knows How"—not only how to conduct laboratory processes, by reason of its twenty years' devotion to the production of "Biologics Only," but—

It also knows how to stand four-square on the proposition that there is only one best way to do a thing, and that that is the only way thinkable or permissible, regardless of extra cost in time and material.

That is why we do not compete in time or in price with laboratories which make vaccines "while you wait."

With a variety of culture media which is amazing in the delicate shading off and gradation of one into another, we coax into vigorous growth organisms that either quickly die, or grow feebly, when cultured on the unfavorable soil of the stereotyped forms of media in general use.

So, whether it is an autogenous or regular stock vaccine, or whether it is one of the sera, or Smallpox Vaccine you need, specify "Cutter's," and you will get the best that experienced specialization and conscientious endeavor can make, for it will be made by

The Cutter Laboratory
(Operating Under U. S. License)

Berkeley - - - - California

"The Laboratory That Knows How"

We shall be pleased to send you our new "Physicians' Price List and Therapeutic Index."

Address The Cutter Laboratory, Berkeley, California, or Chicago, Ill., as is convenient. The Chicago Office is a selling agency only and does no Laboratory work.

BOLEN SUPPORTER

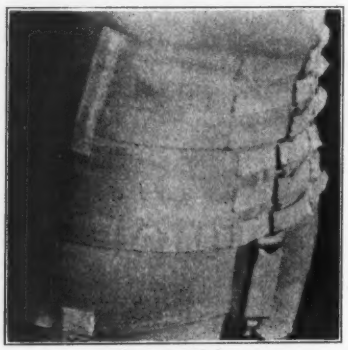
(PATENTED)

Creating Correct Abdominal Supporters is a Science

Enteroptosis Belt

We have mastered its principles and apply them successfuly in constructing *Supporters and Belts* for such conditions as

Pendulous Abdomen, Obesity, Enteroptosis, Floating Kidney, Pelvic Inflammation and Relaxation of Pelvic Ligaments, Sacro-illiac, Relaxation, Hernia, Etc.



Sacro-Iliac Belt

Eminent physicians and surgeons endorse our methods and our products. Their names with names of satisfied wearers, furnished on request.

Mail orders executed, with perfect fitting guarantee

BOLEN MANUFACTURING COMPANY

213 Baird Building OMAHA, NEBRASKA

(Continued from page 30)

Dr. R. C. Perkins, Lynnhaven, aged 95, died at his home July 13.

Dr. Lucian Loften, Richmond, died at his home of apoplexy July 21. He was Medical Inspector of the Richmond Health Department.

Dr. T. N. Sellers, Island Ford, aged 87, died at his home July 7.

Dr. C. Carter, Chatham, aged 41, died at a hospital in Danville July 10.

WEST VIRGINIA

The State Board of Control has purchased the town of Denmar, in Pocahontas County. The buildings and lands are to be used for the new State Colored Tuberculosis Sanatorium which was provided for by the last Legislature.

The West Virginia Public Health Council at a recent meeting voted to cancel reciprocal relations with those states that continue to recognize Class C medical colieges.

Dr. D. B. Bushong, formerly of Sharpsburg, will serve as company physician at a mining camp near Charlestown.

HIGH POWER

Electric Centrifuges

Send for Cat. Cn

INTERNATIONAL EQUIPMENT CO.

253 WESTERN AVE. BOSTON, MASS.

HAY FEVER

Successfully Treated with

BACTERIAL VACCINES

Pollen irritation and breathing of the hot dust laden atmosphere favors the development of pyogenic bacteria in the respiratory tract which then become a primary factor of the disease.

Experience shows that the immunizing influence of an appropriate bacterin will either cure the disease or so modify it that it causes but little distress. Use Sherman's No. 40.

Write for Literature.

MANUFACTURER OF BACTERIAL VACCINES

G. H. SHERMAN M.D.

Detroit, Mich. U.S.A.

Did it Ever Occur to You

as a practising physician to think that so many so-called chronic diseases are only "chronic" because somebody has failed to make the right diagnosis? Just think back over some of these chronics and see if this isn't true.

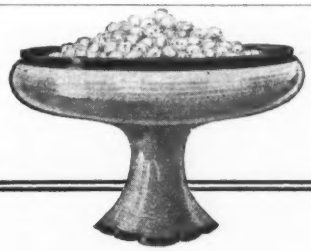
Now, we don't mean to imply that every neglected or "mis-diagnosed" case can be cleared up by a laboratory test, but we recall many that have been so straightened out.

Take *syphilis*, for instance — just make *Wassermann* Tests of some of these cases even though there isn't any history of syphilis. You will be surprised at the result. Look for *tuberculosis* or *streptococcus* infections. Send for our containers for *Blood* or *Sputum* or *Cultures*. They are sent Free. Keep them on hand.

Our Wassermann Test supplemented by a Test that adds from 20 to 30 per cent to the column of positives—the Hecht-Gradwohl—costs your patient only $5.00. All other Tests at equally reasonable rates.

Write us TODAY

GRADWOHL
Biological Laboratories
928 N. Grand Avenue
ST. LOUIS, MO.
Dr. R. B. H. Gradwohl, Director



A Night Dish For Children

Steam-Exploded Grains

Puffed Wheat, Puffed Rice and Corn Puffs are prepared by Prof. Anderson's famous process — which is this:

The grains are sealed in guns, then revolved for an hour in 550 degrees of heat. The trifle of moisture inside of each food cell is thus changed to super-heated steam.

Then the guns are shot. More than 100 million steam explosions occur in every kernel — one for each food cell. The cells are blasted, and digestion is made easy and complete.

Cooking, baking or toasting, it is said, rarely break half of these food cells. This process breaks them all. So Puffed Grains are the best-cooked foods we know.

They are thin, airy bubbles, crisp and flavory — most delightful morsels. There is nothing else so likable in milk.

We believe that Puffed Grains must be considered the ideal good-night foods.

Puffed Rice Puffed Wheat Corn Puffs

Each 15c Except in Far West

1939

DOSTER-NORTHINGTON DRUG CO.
CENTRIFUGE

Every detail in the construction of the Shelton Centrifuge is based upon scientific experiments to obtain quick and accurate results.

Equipped with a specially designed balance wheel to insure uniform motion at every speed.

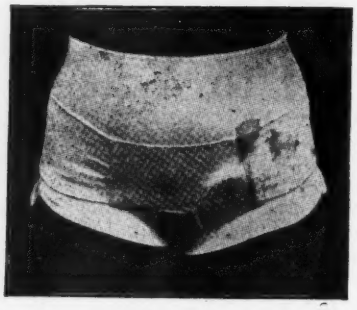
Socket speed regulator at end of cord, instead of under base of instrument—more convenient to operate, and eliminates possibility of accidents against the swinging arms.

Beautifully designed and finished in triple nickle-plating. Electrically and mechanical perfect, and fully guaranteed.

Price (with double arm) $25.00
Price (with four arms) 30.00

DOSTER-NORTHINGTON DRUG CO.
Surgical Instruments, Hospital Supplies, Wholesale Drugs
BIRMINGHAM, ALABAMA

THE STORM BINDER AND ABDOMINAL SUPPORTER
(Patented)



No Leather, No Whalebones, No Rubber Elastics. Washable as Underwear
ADAPTED TO USE OF MEN, WOMEN, CHILDREN AND BABIES
For Hernia, Relaxed Sacroiliac Articulations, Floating Kidney, Low and High Operations, Ptosis Pregnancy, Pertussis, Obesity, Etc.
Send for new folder and testimonials of physicians. General mail orders filled at Philadelphia only—within twenty-four hours

Katherine L. Storm, M. D. 1541 Diamond Street PHILADELPHIA

AIDS IN DIAGNOSIS

Wassermann Test - - - Blood and Spinal Fluid, using both Wassermann and Noguchi system in each case	$ 5.00
Complement Fixation Text - Gonorrhea, Tuberculosis, etc.	5.00
Tissue Pathological Examination	5.00
Abderhalden Test - - Pregnancy, Dementia Precox, Carcinoma	5.00
Autogenous Vaccines - -	$ 5.00
Smears, Sputa, etc. - - -	1.00
Urinalysis - - - - -	1.50
Pasteur Treatment - - - (Antirabic Vaccine, P.D.&C.—Cumming)	40.00

FREE Bleeding tubes, Sterile containers, Culture Media and instruction for sending specimens.

Our names and reputations stand back of our work

ESTABLISHED 1904

CHICAGO LABORATORY

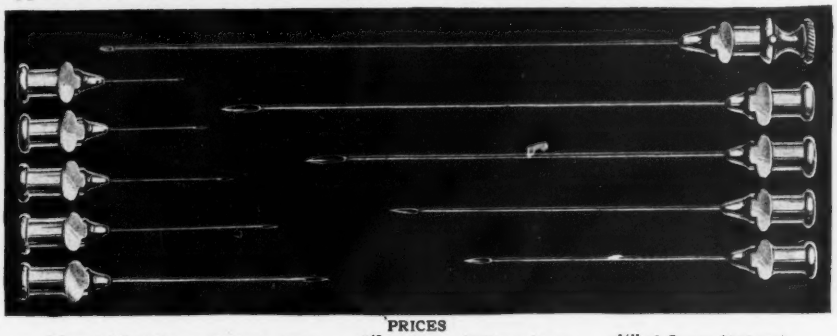
RALPH W. WEBSTER, M. D., Ph. D., Chemical Department
THOMAS L. DAGG, M. D., Pathological Dept.
C. CHURCHILL CROY, M. D., Bacteriological Dept.

25 East Washington Street
CHICAGO, ILL.

Tempered Gold Hypodermic Needles

Cannot Rust and their immunity from corrosion contributes the last word in hypodermic asepsis and technical efficacy.

Moderate Cost and great durability indicate an obvious economy and eliminate every obstacle to their universal adoption.



PRICES

⅜" and ½"	24 Gauge	$3.00 per dozen	1¼"	20 Guage	$9.00 per dozen	2½"	18 Guage	$3.00 each
⅝" and ¾"	23 "	4.50 " "	1½"	20 Guage	1.00 each	3 "	17 "	4.00 "
1"	21 "	6.00 " "	2"	19 "	2.00 "	3½"	17 "	5.00 "

To the Practitioner who is unable to secure these Needles otherwise, we will mail postpaid one dozen assorted needles from ⅜" to 1¼" upon receipt of five dollars.

When ordering, it is important to mention the kind of syringe the needles are required to fit.

PRECIOUS METALS TEMPERING CO., Inc., Suite 527, 30 Church Street, New York

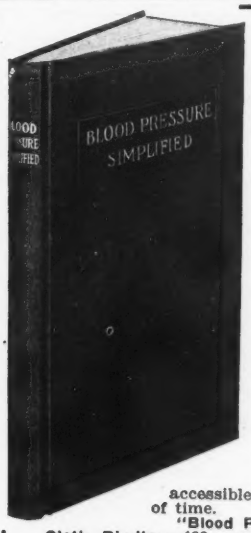
50% BETTER

Prevention Defense Indemnity

1. All claims or suits for alleged civil malpractice, error or mistake, for which our contract holder,
2. Or his estate is sued, whether the act or omission was his own,
3. Or that of any other person (not necessarily an assistant or agent),
4. All such claims arising in suits involving the collection of professional fees,
5. All claims arising in autopsies, inquests and in the prescribing and handling of drugs and medicines.
6. Defense through the court of last resort and until all legal remedies are exhausted
7. Without limit as to amount expended.
8. You have a voice in the selection of local counsel.
9. If we lose, we pay to amount specified in addition to the unlimited defense.
10. The only contract containing all the above features and which is protection per se.

A sample upon request

THE MEDICAL PROTECTIVE CO.
of FT. WAYNE, IND.
Professional Protection Exclusively



The Chapter on Blood Pressure in Life Insurance Is of Value to Every Examiner

Compiled by our medical department and incorporating latest research. Gives facts in a manner that will be readily understood by the practitioner. Contains original illustrations explaining the physiology, technique and auscultatory phenomena. A chapter devoted to detecting irregularities by means of the sphygmomanometer offers a new method of diagnosis for the observing physician.

In this book the present knowledge of pressure is condensed, the main facts readily accessible without ex tensive use of time.

"Blood Pressure Simplified"
Cloth Binding—100 pages—Illustrated, $1.00
At your surgical instrument dealer's or direct

Taylor Instrument Companies
Rochester, N. Y.

A Post card brings "Blood Presssure Manual"—a booklet of 32 pages

"KELENE"

PURE CHLORIDE OF ETHYL

FOR LOCAL AND GENERAL

ANAESTHESIA

MANUFACTURERS:

FRIES BROS.

92 READ ST. NEW YORK

SOLE DISTRIBUTORS FOR THE UNITED STATES

MERCK & CO.

NEW YORK RAHWAY, N. J. ST. LOUIS

Literature Sent Upon Request

Bayer-Tablets

AND

Bayer-Capsules

OF

ASPIRIN

(5 grs. each)

CONTAINS THE ORIGNAL PRODUCT

Made in the United States since 1904

The trademark "Aspirin" (Reg. U. S. Pat. Office) is a guarantee that the monoaceticacidester of salicylicacid in these tablets and capsules is of the reliable Bayer manufacture.

Patronize our advertisers—mention the Journal when you write them.

MULFORD
FOR THE CONSERVATION OF LIFE
LABORATORIES

Immunize Your Patients Against

Fall Hay Fever

With Mulford Brand Hay Fever Pollen Extracts

Hay Fever "Fall" Pollen Extract contains the protein nitrogen obtained from the pollens of Ragweed, Golden-Rod and Corn. A few patients require immunization against all three of these pollens.

Hay Fever "Ragweed" Pollen Extract contains the protein nitrogen of Ragweed alone, the cause of practically all the Hay Fever cases occurring in the Fall.

Hay Fever Pollen Extracts—**"Fall"** and **"Ragweed"** —are supplied as follows:

No. 0.—In packages of four sterile syringes, A, B, C, D strength
No. 4.—In 20-mil vials, each mil strength of Syringe D
No. 9.—In 5-mil vials, each mil strength of Syringe D
No. 11.—Single syringe, D strength
No. 12.—Single syringe, E strength
No. 14.—Single syringe, F strength

Syringe A contains 0.0025 mg. pollen protein nitrogen
Syringe B contains 0.005 mg. pollen protein nitrogen
Syringe C contains 0.01 mg. pollen protein nitrogen
Syringe D contains 0.02 mg. pollen protein nitrogen
Syringe E contains 0.04 mg. pollen protein nitrogen
Syringe F contains 0.08 mg. pollen protein nitrogen

When ordering specify "Hay Fever Fall Pollen Extract" or "Hay Fever Ragweed Pollen Extract" as may be desired.

For immunization and treatment of Fall Hay Fever, first dose (Syringe A) should be given at least 30 days before expected attack, followed by B, C and D at five-day intervals. Syringe D strength should be used at weekly intervals until immunity is established. During the period of accustomed attack the extract should be used in such strength and at such intervals as the individual patient may require.

H. K. MULFORD CO., Philadelphia, U. S. A.

Manufacturing and Biological Chemists

34618

Full literature will be mailed upon request

Adrenalin in Hay Fever

IN either of the forms mentioned below, Adrenalin, in a vast majority of cases, provides a rational and effective treatment for hay fever. Sprayed into the nostrils, this powerful astringent constricts the capillaries, arrests the nasal discharge; minimizes cough, headache and other reflex symptoms; hastens the resumption of natural breathing, and secures for the patient a marked degree of comfort.

Adrenalin Chloride Solution

For spraying the nose and pharynx (after dilution with four to five times its volume of physiologic salt solution).
Supplied in ounce bottles, one in a carton.

Adrenalin Inhalant

For spraying the nose and pharynx (full strength or diluted with three to four times its volume of olive oil).
Supplied in ounce bottles, one in a carton.

THE GLASEPTIC NEBULIZER

is an ideal instrument for spraying the solutions above mentioned. It produces a fine spray and is suited to oils of all densities, as well as aqueous, spirituous and ethereal liquids. *Price, complete (with throat-piece), $1.25.*

Laboratories: Detroit, Mich., U. S. A.;
Walkerville, Ont.; Hounslow, Eng.

Parke, Davis & Co.

Branch Houses and Depots: New York, Chicago, St. Louis, Baltimore, New Orleans, Kansas City, Minneapolis, Seattle, Buffalo, Pittsburgh, Cincinnati, Indianapolis, U.S.A.; London, Eng.; Montreal, Que.; Sydney, N. S. W.; Petrograd, Russia; Bombay, India; Tokio, Japan; Buenos Aires, Argentina; Havana, Cuba.

ast
ent
ent
zes
np-
ed

its

our

0.